

## Chapter 3

# Status of Education and Training for Heavy and Petrochemical Industries

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### 3. Status of Education and Training for Heavy and Petrochemical Industries

Technical Sector Education in Vietnam has a history and actual results. The support for the 3 Polytechnic Universities of Hanoi, HCMC University of Technology and Danang University of Technology (considered to provide the highest quality of training in Vietnam) is expanding more and more. These 3 schools are located on top of the representation triangle

There are 2 National Universities: National University of Hanoi and National University of Ho Chi Minh City where there are Technical faculties. In addition, there are many specialized universities with Technical faculties under the management of the state organizations / department in Industrial sectors such as Construction, Transport, Telecommunications, Energy, etc...

In the table 3-1 below, it shows universities specialized management by the Ministry of Industry and Trade, at the time of 2011 is 18 schools. In it, including the Hanoi University of Industry (HaUI) that JICA is supporting and HCMC University of Industry (HUI) - is the object of this survey.

Its campus in Thanh Hoa is the only University with industrial faculties providing human resources for Nghi Son special economic zones where the Japanese firms such as Cement Co. NM, Idemitsu Kosan are investing or preparing investment.

**Table 3-1 List of Universities, Upper Colleges, Lower college's management by the Ministry of Industry and Trade**

No.	Name of School	Location
1	Hanoi University of Technology (HUT)	Ha Noi
2	Hanoi University of Industry (HaUI)	Ha Noi
3	Hanoi Industrial Economic College	Ha Noi
4	Industrial economics and technique college I	Ha Noi
5	Industrial economics and technique college	HCMC
6	Ho Chi Min City University of Industry (HUI)	HCMC
7	Gao Thong Technical Collge District I	HCMC
8	Ho Chi Min City College of foodstaff Industry	HCMC
9	Saigon Technology University	HCMC

10	Ho Chi Min City University of Technology	HCMC
11	Chemical Industry College	Phu Tho
12	Mining Technical College	Quang Ninh
13	Mechanics and Metalorogy College	Thai Nguyen City
14	Sao Do Industrial College	Hai Duong
15	Viet-Hang Industrial College	Ha Tay
16	Nan Dinh Industiral College	Nan Dinh
17	Tuy Hoa Industrial College	Phu Yen
18	Hue Industial College	Hue

(Source: UNICO International Corporation established from the files of the Ministry of Industry and Trade)

### 3.1 Status of Education and Training in Ho Chi Minh City University of Industry<sup>1</sup> – HUI- The main campus (HUI - HCMC)

#### 3.1.1 Overview and Basis of HUI and main campus HUI - HCMC

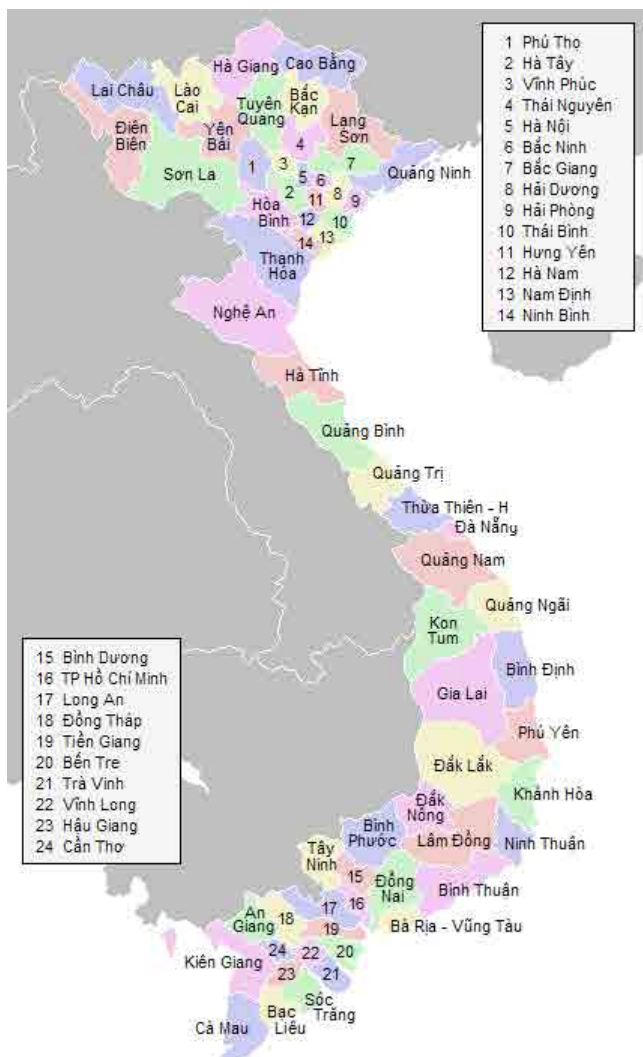
HUI-the predecessor of "DONBOSCO Engineering Lower College-was established in 1957. After South Vietnam was fully liberated in 1975, the school was renamed "Schools of Engineering IV". In 1994 it was renamed the "Lower colleges of Industrial Engineering IV". March 1999 renamed "Industrial Upper College IV". Then, in December 2004, the School was upgraded to (Ho Chi Minh City University of Industry - HUI), managed by the Ministry of Industry and Trade (MOIT).

In addition to the main campus in HCM City, HUI has 5 Training Campuses follows:

- (1) Bien Hoa Campus - Dong Nai (Dong Nai)
- (2) Thai Binh Campus (Thai Binh City)
- (3) Quang Ngai Campus (Quang Ngai)

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<sup>1</sup> To be exact, called the Industrial University of Ho Chi Minh City is true, but the used common name is the Ho Chi Minh University of Industry.



(4) Thanh Hoa Campus (Thanh Hoa Province)

(5) Nhon Trach Campus - Dong Nai (Dong Nai)

In particular, Thanh Hoa Campus was established most recently.

### 3.1.2 Education System in the HUI Main campus - HCMC

In the main campus HUI - HCMC there are 6 training system (from A to D, from B 'to C' - refer to table below illustrates).

A University

- B Upper Professional College
- B ' Upper Vocational College
- C Lower Professional College (2 years)
- C ' Lower Vocational College (2 years)
- D Lower Professional College (4 years)

The difference between Professional Training System (Professional Course) and the Vocational Training System (Vocational Course) is the professional training system is managed by the Ministry of Education and Training (MOET) and the vocational system under management of the Ministry of Labour - Invalids and Social Affairs (MOLISA). In term of the field of education there are the same area and also the different areas. In term of content of training for the vocational system, subjects content accounted for 30% of subjects, and practical content - practice 70%.

For University and professional College System, applied the credits, and professional college system

applied the Year.

Even with 5 training Systems outside the University system can also be obtained Bachelor Degree by attending Transitional Course. The Transitional system is regarded as an independent system, with separated curriculum and textbooks.

There are 4 routes to obtain a Bachelor (from ① to ⑥ - refer to illustration in Table 3-1 below) <sup>2</sup>

① Study on University System 4 years after upper secondary school graduation. There are entrance exams uniformly throughout the country. Upon graduation, they may receive a Bachelor.

②⑤ Study on Upper Professional College System, a college in three years after upper secondary school graduation. School graduates have received as Upper Professional College Diploma) or Vocational Degree (Diploma of Upper Vocational College) corresponding to each system. If learning to University Transitional system 1.5 years (E) one can obtain a Bachelor.

③⑥ Study on professional lower colleges, vocational lower colleges 2 years System after upper secondary school graduation. On graduating, they receive the Certificate of Upper Professional College or a Certificate of Upper Vocational College corresponding to each system. If keeps learning to College Transitional System 1.5 years (F) one can get a professional upper college Diploma or vocational upper college diploma. If further study through the University Transitional System with another 1.5 years (E) one can obtain a Bachelor.

⑤ Study on Lower Professional college system 4 years after graduating from upper secondary school. In these 4 years, 2 years corresponds to upper secondary programs<sup>3</sup> and 2 years remaining to complete Lower college program. Then, if study further on College Transitional system 1.5 years (F) one can get a professional upper college Diploma, if further study through the University Transitional System 1.5 years (E) one can obtain a Bachelor. Either after graduating from this professional lower college system learning this University Transitional system directly for 3 years (G) one may also obtain Bachelor.

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<sup>2</sup> There is also the in-service training system for 2.5 years (no information received).

<sup>3</sup> The reason that Upper Secondary school system which is usually 3 years can be completed within 2 years is because Upper Secondary school is normally divided into 2 shifts ,morning and afternoon shift, only a half-day school, whereas the Lower Colledge system is full- day school.

Models of Transitional		Under MOET				Under MoLISA			
		①	②	③	④	⑤	⑥		
		University	Professional Courses→University Degree			Vocational Courses→University Degree			
age	Bachelor Degree(Engineer)	Total 4 years	Total 4.5 Years	Total 5 Years	Total (2)+5 years	Total (2)+5 years	Total 4.5 Years	Total 5 Years	
24									
23				Transitional Course 1.5 Years E				Transitional Course 1.5 Years E'	
22	University 4 years	University 4 Years A	Upper Professional College 3 Years B	Transitional Course 1.5 Years E	Transitional Course 3 years G	Transitional 1.5 Years E	Upper Vocational College 3 years B'	Transitional Course 1.5 Years E'	
21	Upper College 3 Years			Transitional Course 1.5 Years F				Transitional 1.5 Years F	Transitional Course 1.5 Years F'
20	Lower College 2 Years			Lower Professional College 2 years C				Transitional 1.5 Years F	Lower Vocational College 2 years C'
19									
18					4 years Lower Professional College D				
17	Upper Secondary (Senior High School)								
16									
15									
14	Lower Secondary (Junior High School)								
13									
12									

**Chart 3-1 The training systems available at the HUI - HCMC main campus**

**(As of January 2012)**

*(Source: Prepared from the hearing information)*

### 3.1.3 Faculty of Chemical Engineering

As Table 3-2, in entire HUI there are 40 Technical Faculties and 18 Faculties of Economics, Foreign Languages.

***Table 3-2: List of Faculties of the Ho Chi Minh University of Industry***

Technological Faculty	Economic and Foreign Languages Faculties
Electrical technology, Mechanical technology, Thermal technology, Electronics technology, IT & communication technology, Automotive technology, Textile & Garment technology, Control & automation technology, Chemical technology, Food technology, Environmental Technology, Information Technology, HVAC Technology, Welding technology, Organic chemistry, Inorganic chemistry, Analytical chemistry, Petrochemicals,	Business, Accounting, Finance, Economics, Marketing, Fashion Design, Business Travel, Food Business Librarian, Business small and medium enterprises, English.

Biotechnology, Chemistry Machinery and equipment technology, Computer hardware technology, Mechano-Electrical technology, Information network and communication technology, Equipment and machinery maintenance technology, Electrical maintenance technology, Air conditioners assembly technology, Automobile maintenance, Power projects, Power distribution technology construction, Refrigeration technology, Inorganic technology, Oil refining technology, Pharmaceutical analysis, Food production technology, Garments and fashion technology, Industry production technology, mechanical technology and automation	
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*(Source: Documentation of the HUI)*

### **3.1.4 Number of Students**

As of late 2010, the total number of students of all the main campus and other campuses is around 99,000 students. The number of student in main campus HUI - HCMC is approximately 77,000 students.

Number of University Students (including Transitional system, Part Time system) is about 25,000, Upper College students (including Transitional system, Part Time system) is 36,000, Lower college students (including part time students) is 16,000 (HUI, 2011).

### **3.1.5 Number of Teachers, Officials**

Number of Teachers, School Officials of the entire HUI is about 2,500 people. Among them permanent teachers is 2,000 people, short-term contract teachers is about 500 people. Among the permanent Teacher there are those with infinite term, those with finite term and during Teacher Test (HUI, 2011).

Even in the same subject, depending on the Degree that teachers possess they are limited to Levels that they can teach (University, upper College, lower college). Upper College graduates may be admitted to the teaching assistantship, but not recognized as Instructors. There are many teachers in the teaching process pursue the University, Master of Science Degree to improve their degree, and HUI also encourage this.

Number of Teachers of Main campus HUI - HCMC is around 1,500. Of which about 600 BA, 700 masters, 100 doctors, about 50 PhD candidates, about 50 teaching assistants

In the Faculty of Technology of Main campus HUI - HCMC now there are 58 teachers, professors including 11 Bachelor, 31 masters, 12 doctors, 4 PhD candidates. (HUI - HCMC, 2011 (1) The organization chart of main campus HUI - HCMC is 14 Departments/units. The official website of the HUI on the Internet is still operational.

### 3.1.6 Physical facilities

In all there are 27 Establishments, Institutes and Training center - Training, which has 14 establishments for experiment activities and practice of the Faculty of Chemical Engineering.

### 3.1.7 Semester

In HUI it is applied the 3 semester regime<sup>4</sup>. The semesters begin in September, December and March. Each semester consists of 15 weeks in which 10 weeks of lectures, for spare 1 week, 2 weeks preparing for the exam, 2-week semester exam period. With the practice subjects the study period was 12 weeks. There are 3 weeks for the New Year holiday in January, 4-week summer break in July. In Thanh Hoa campus HUI - TH also apply the same semester system.

### 3.1.8 In terms of governance, financial

The main campus HUI - HCMC play the main role of financial management of the entire school, including the main campus and other campuses of the HUI. As described in Table 3-3, the budget expenditure of the whole school in 2011 was around 613 billion VND, up 23% over the previous year. In total revenues, the revenues from the State and 5.3% in 2010, estimated in 2011 was 4.6%. Compared to other Public National Universities about 8% (see Section 2.2.5) this rate is lower. The revenues from Main campus is up 95% of the school, the operation of the school administration smooth.

**Table 3-3 Summary of revenues and expenditures of all campus of HUI in 2010 and estimates for 2011**

	In 2010		Estimated for 2011		
	Amount (VND)	Rate (%)	Amount (VND)	Rate (%)	Compared to the previous year (%)
Revenues from State	27,765,000,000	5.3	29,620,000,000	4.6	6.7
Other sources of revenue	493,311,767,639	94.7	608,133,050,000	95.4	23.3
Total revenues	521,076,767,639	100	637,753,050,000	100	22.4
expenditure	497,989,617,522		612,964,458,307		23.1

<sup>4</sup> At the University in Vietnam are usually 2 semesters mode.



Balance	23,087,150,117		24,788,591,693		7.4
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*Source: HUI, 2011*

### **3.1.9 In terms of cooperation, with foreign support**

HUI exchanges relations with 36 Universities and Upper colleges overseas. The contents of cooperation and exchanges primarily for teacher training, Education experience sharing, Visits reciprocity, cooperation training course organized etc...

In HUI there are 2,700 Students from Douglas Mawson Institute of Technology (DMIT) of Australia, 350 Students from SIAST (The Saskatchewan Institute of Applied Science and Technology) of Canada and 550 Students from NCU (The University of North Carolina) to attend.

The school was supported by ADB with Reference Book and Experiment equipments for Vocational Upper and Lower Colleges of Faculty of Petrochemical.

Schools also exchange relations with the three universities in Japan:

- University of Tokyo: At around March every year, Professor of Environmental Engineering, Climate Change, Agriculture of Tokyo University for organizing the training of School Teachers.
- Hokkaido University: discussion with the University to organize experience teaching training program in the field of environmental engineering for master courses. The discussion program ended.
- Kogakuin University: Cooperation on Joining CO2 emissions Group in East Asia. Previously, the HUI has also sent many experts in the fields of Management and Engineering to short-term training for AOTS (The Association for Overseas Technical).

### **3.1.10 Collaboration with the Private Enterprise**

HUI pays great attention to the Link to the Industry as well as universities. Schools realize the importance of innovation to the curriculum of the School, Research can contribute to improving the productivity of the industrial fields.

Through the internship program or in the Enterprise Workshop on Energy, Manufacturing etc... Students have the opportunity to be exposed to the facility, equipment, advanced technique.

Apply the achievements of the University is also an advantage for the enterprise.

The school has a good relationship with many enterprises, so a lot of enterprises receiving training (Internship) in the enterprise. The timing of these practices is largely from 3 weeks to a month, and students receive credits.

## **3.2 Current status of education and training at HUI Thanh Hoa campus**

### **3.2.1 General features of HUI Thanh Hoa campus (HUI-TH)**

HUI-TH-one of five campuses of the HUI-HCMC was established in Thanh Hoa province in 2008 after the merger with the predecessor "The Thanh Hoa pedagogical lower college"<sup>5</sup>. HUI-TH is the latest establishment of the campuses of HUI.

Two years after its establishment, the school has invested about 200 billion dong (about nine million six hundred thousand dollars, or 750 million yen<sup>6</sup>) to build new facilities appropriate to higher education. The phase one almost ended in 2011, the school land has been expanded to more than about 2 times. The phase 2 is currently under construction (from 2011 to 2013).

HUI-TH is the only university in Thanh Hoa having Faculty of Technology, and it is expected as the unique agency for implementation of educational to prepare human resources in industrial technological in Thanh Hoa province.

On the other hand, HUI-TH is also expected by 2015 will become the biggest training center in northern Vietnam.

### **3.2.2 Organization of the HUI-TH**

#### **3.2.2.1 Management department**

All business activities of the school are managed by the HUI-HCMC, management department of HUI-TH only make the collection of tuition fees and other income (see Section 3.1.8) and submit for the main campus. Regarding the number of students to be recruited and the number of teachers also decided by the main campus on the basis of the consideration and then make decision. The main campus also pays for teachers, staff and the entire supply of capital to build facilities or purchase of teaching equipment.

The primary responsibility of the management department of HUI-TH is management of training program, courses, to inspect the presence or absence of students, and test/examination organization. In addition, management must be done for enrollement, graduation, or separate income of the establishment, etc. ...In HUI, 95% of operating capital is provided by the HUI itself, so outside of tuition fees, the income from the operation of the library or recreation activities of students<sup>7</sup>, etc ... are also considered part of income.

On teacher recruitment, HUI-TH is responsible by asking trusted sources which can introduce, or through the website information from there proceed therein. After selecting the referral, HUI-TH will send a

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<sup>5</sup>Context to establish HUI-TH campus was Thanh Hoa province had promotion activities for MOIT / MOET on the setting up of the university aiming to prepare human resources based on information Nghi Son refinery will be built in Thanh Hoa. When it was suggested to HUI, HUI accepted the proposal and the establishment of HUI-TH campus became a reality. (The interview was conducted in HUI-HCMC office.)

<sup>6</sup> Exchange rate applied on 24/1: 1US\$ = 20,670 VND, 1 Yen = 266.3 VND

<sup>7</sup> The reason for investment in equipment and recreational activities (for playing computer games, etc ...) for students in schools not only by income purposes, but also to help students in the school also learning and relaxing, no need to go outside the school.

request to the HUI-HCMC and receive consent from the HUI-HCMC.

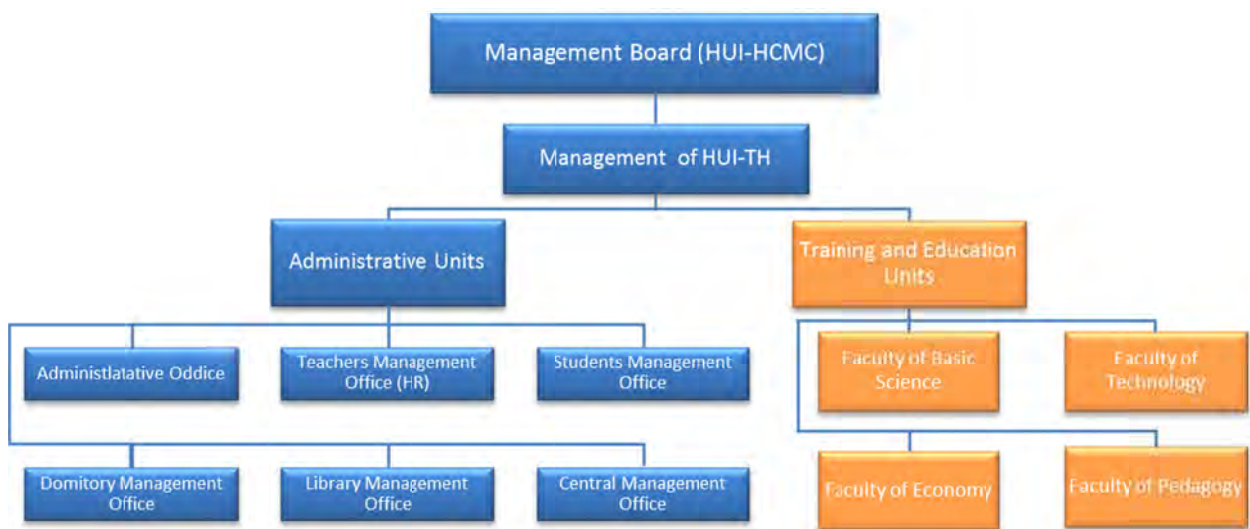
Having good relationships with local administrative bodies (in Thanh Hoa) as HUI-TH is a state school. However, Thanh Hoa province is conducting inspection twice a year (sending school inspectors) under mandate from the government, conduct staff meetings of the HUI-TH, and request HUI-TH to submit reports.

On the HUI-TH side, it will go to administrative agencies in Thanh Hoa province to submit required reports or request for links with other universities, etc...

### 3.2.2.2 Faculty

HUI- TH campus has 4 faculties as follows:

1. Faculty of Basic sciences: curriculum of basic subjects for first year and second year
2. Faculty of Technology
3. Faculty of Economics
4. Faculty of Pedagogy



***Figure 3-2: Organizational chart of the HUI-TH campus (at January 2012)***

*(Source: created by hearing information from the HUI-TH)*

### **3.2.3 The education system of the HUI-TH**

Faculty of Technology of HUI-TH, as in Table 3-3, has 4 out of 6 courses described in Section 3.1.2. For undergraduate system, students enrolled in IT field in 2009, and in in 2011, petrochemical industry, electrical engineering students enter the first course in 2011 (26 people). The number of University students including Transitional system is 385. System 1393 professional college students, job-generation college students are approximately 1366 people.

In addition, normally in universities there was not lower college course, but in HUI-TH is set up this system. HUI-TH plans will not to receive additional lower college students, and after these lower college students now graduate thid training system will not exist anymore. The current number of students at lower college level is 86.

In the HUI-TH, the Transitional courses students (from lower college to upper college, or from upper college to university level) will learn in out off working overtime (evening time and Saturday and Sunday)

Models of Transitional		Under MOET			Under MoLISA
		①	②	③	⑤
		University	Professional Courses→University Degree		Vocational Courses→ University Degree
	Bachelor Degree(Engineer )	Total 4 years	Total 4.5 Years	Total 5 Years	Total 4.5 Years
24					
23				Transitional Course	
22	University 4 years	University 4 Years A	Transitional Course 1.5 Years E	Transitional Course 1.5 Years E	Transitional Course 1.5 Years E'
21	Upper College 3 Years		Upper Professional College 3 Years B	Transitional Course 1.5 Years F	Upper Vocational College 3 years B'
20	Lower College 2 Years			Lower Professional College 2 years C	
19					
18					
17	Upper Secondary (Senior High School)				
16					
15					
14	Lower Secondary (Junior High School)				
13					
12					

***Figure 3-3: Education and training systems in Faculty of Technology<sup>8</sup> HUI-TH campus (as of January 2012)***

(Source: created by hearing information)

### 3.2.4 Method of admission

Student Admission Method of HUI-TH Faculty of technology is as follows:

- University (4 years) (A): Selection of students from three blocks (A, D1, B) based on the documented results of the university entrance exam (University Entrance Examination: UEE) unified across the country and regulated<sup>9</sup>. by MOET.
- Professional Upper Colleges (3 years) (B): Same as for university admissions, students choose

<sup>8</sup> In HUI-HCMC, there is faculty of chemical engineering equivalent to faculty of technology in HUI-TH.

<sup>9</sup> When complete upper school will have upper school exam (SSLE), at 2009 MOET has announced the exam will be merging this along with a university entrance exam within 2 or 3 years, but until present two exam has not yet been combined.

from three blocks (A, D1, B) based on the university entrance exam results UEE.

- Vocational Upper College (2 years) (B '): Selection based on student achievements in upper secondary school, and test scores (Secondary School Leaving Examination: SSLE).
- Professional Lower college (2 years) (C '): Selection based on student achievements in high school, high school graduation (Secondary School Leaving Examination: SSLE).

UEE is formulated dividing into four blocks as follows:

- ① Block A: Mathematics, Physics, and Chemistry
- ② Block B: Mathematics, Chemistry, and Biology
- ③ Block C: Literature, History, and Geography
- ④ Block D1: Mathematics, Literature, Foreign Languages

Points needed to pass the exam in September 2011 of the HUI-TH are described in the Table 3-4 below. Pointing scale necessary to apply for admission at each college is different, and this scale will be published to schools candidates from around March every year. Depending on the year and on the number of candidates of that year the pointing scale will change.

**Table 3-4: Criteria for admission of the academic year 2011 at HUI-TH campus<sup>10</sup>.**

No	System	Exam Sector	Required score	Remarks
1	Formal University	A, D1, B	13 above	Sector B alone 14 above
2	Upper college professional	A, D1, B	10 above	Sector B alone 11 above
3	Upper college vocational	Consider the backlog of Upper Secondary school		
4	Lower college professional	Consider the backlog of Upper Secondary school		

(Source: the document issued by the Faculty of Technology HUI-TH)

Only graduating students of the university can take the Transitional entrance examination from upper college to university or from lower college to upper college. The candidates participated in this exam will have to execute the Fundamental subjects and Practical subjects. The graduate professional courses and vocational courses will have to execute the same exam.

<sup>10</sup> Admissions applications of oriented upper college and professional secondary school are alike, but the passing points of them are different. Oriented upper colleges require higher performance

The application for course in October will be received from August to September, but only enrolled in September. Description in Table 3-5 below shows the desired number of people enrolled, the number of people passed, passing rates and number of people enrolled in the fields of Faculty of technology in September 2011.

Passing rate is above 75% (excluding items with 0%). At lower college course, currently not receiving new students except for field in which there are a large number of students who wish to enter such as electrical engineering.

**Table 3-5: Number of people wanted to apply, number of students passed the exams, passing rates, number of admission to the Faculty of Technology in September 2011**

	No.	1	2	3	4	5	6	7	8	9	Total
	Sub-Field	IT Technology	Mechanical Technology	Automotive Technology	Electrical Technology	Electronics Technology	HVAC Technology	Petrochemical Technology	Chemical-Analytical	Environment Technology	
University	Applied	42			49					33	124
	Passed	36			37					26	99
	Pass ratio(%)	85.7			75.5					78.8	79.8
	Enrolled	33			37					26	96
University Transitional from U. College	Applied				41			216			257
	Passed				38			192			230
	Pass ratio(%)				92.7			88.9			89.5
	Enrolled				38			192			230
Upper Professional College:	Applied	87	101	92	163	56	50	78		40	667
	Passed	71	85	88	152	54	48	69		40	607
	Pass ratio(%)	81.6	84.2	95.7	93.3	96.4	96.0	88.5		100.0	91.0
	Enrolled	62	83	82	148	51	47	62		40	575
Lower Professional College	Applied	9	12	5	45	3	1	4			79
	Passed	0	0	0	36	0	0	0			36
	Pass ratio(%)	0.0	0.0	0.0	80.0	0.0	0.0	0.0			45.6
	Enrolled	0	0	0	36	0	0	0			36
Upper Prof. College Transitional from L. College	Applied							36			36
	Passed							31			31
	Pass ratio(%)							86.1			86.1
	Enrolled							31			31
Upper Vocational College:	Applied	86	87	123	210	60		84		7	657
	Passed	69	70	108	185	54		78		0	564
	Pass ratio(%)	80.2	80.5	87.8	88.1	90.0		92.9		0.0	85.8
	Enrolled	62	62	96	172	43		72		0	507

(Source: created by the materials provided by Faculty of Technology, HUI-TH)

### 3.2.5 Field

At Faculty of Technology of HUI-TH as in Table 3-6, currently there are eight Fields and 9 Sub-Fields. The Petrochemical field is belonging to chemical engineering sector.

In fact, the fields and, the courses will be opened changing each year, depending on the number of admissions or the number of graduates.

**Table 3-6: The fields of Faculty of-Technology, HUI TH campus (as of February 2012)**

	大分類		小分類	略称
1	IT technology	1		TH
2	Mechanical technology	2		CK, CT
3	Automobile technology	3		OT
4	Electrical technology	4		DI
5	Electronic technology	5		DT
6	HVAC technology	6		NL
7	Chemical technology	7	Petrochemical	HD
		8	Analytical	PT
8	Environment technology	9		MT

(Source: created by information technology to hear in science basis HUI-TH)

### 3.2.6 The number of students

The number of students of Faculty of-technology HUI TH campus at February 2012 was 3,225 people. Number of university students including Transitional system 385 students, number of professional upper college students, including Transitional students is 1,393 people, lower college students is 82 people. Among university students, students of information technology currently in 3rd year is 92 people, students of chemical engineering and petrochemical currently in first-year are 37 and 26 respectively, a total of 155 people. The majority of university students are Transational course students from professional upper colleges and vocational upper colleges, accounting for 230 people. Whether or not to maintain the professional lower college depends on the number of people applying for admission. However if the status does not change, after 82 electrical engineering students now graduate, it is expected to abandon this system.

View by field as described in Table 3-7 and Chart 3-4, the number of students of petrochemical is the largest, with 835 people. It is followed by electrical engineering students, with 774 people. The number of students of the two fields is by many times more than the number of students of other fields.

If compare the number of students in the petrochemical with the overall Faculty of Technology on each system, the overall number of students of petrochemical in professional upper college-equivalent to the number of students of vocational upper colleges

But if compared the petrochemical and the electrical engineering, the professional upper college-students accounted for 223 people, a vocational upper college student is more numerous with 294 people. HUI is the predecessor of vocational upper hence the vocational colleges system should flourish, and the HUI campus considers the practice very seriously.



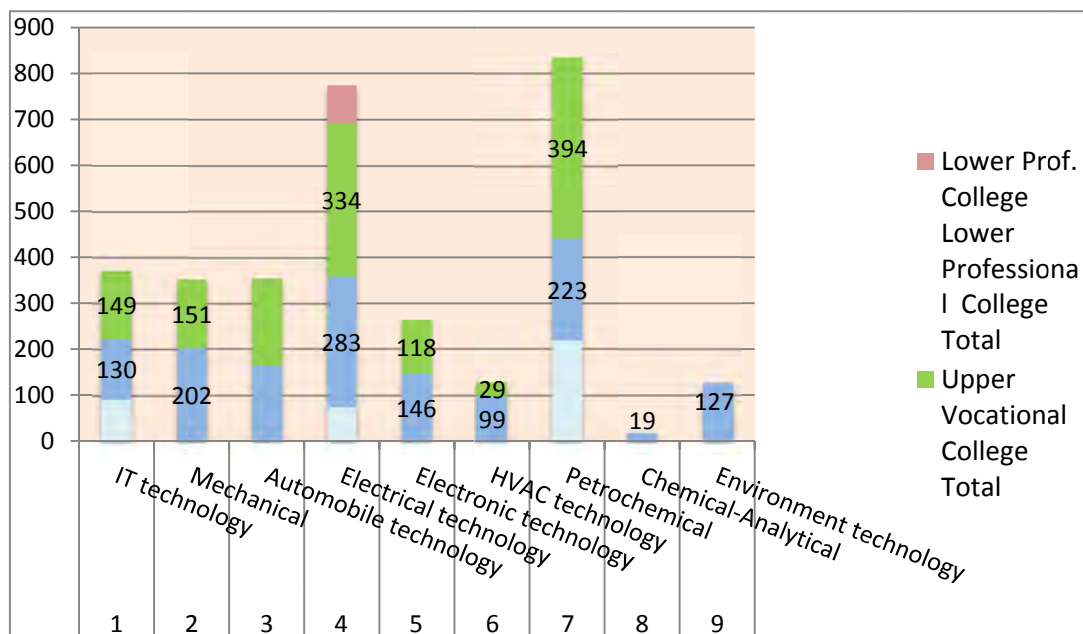
Block codes are assigned for each field of faculty, and the number of students or the time of graduation is managed by the blocks.

**Table 3-7: Number of student of Faculty of Technology HUI-TH campus divided by each field, each system (as of February 2012)**

			Faculty of Technology, Existing Student Number										
			University			Upper Professional College			Upper Vocational College			Lower Prof. College	Grand total
Field	Sub Field		University	Transitinal from Upper Prof. College and Upper Voc. College	Total	Upper Professional College	Transitional from Lower Prof. College	Total	Upper Vocational College	Transitional from Lower Voc. College	Total	Lower Professional College Total	
1: TH	IT technology	1:IT technology	92	0	92	130	0	130	149	0	149	0	371
2: CK, CT	Mechanical	2:Mechanical	0	0	0	202	0	202	151	0	151	0	353
3: OT	Automobile technology	3:Automobile technology	0	0	0	164	0	164	191	0	191	0	355
4: DI	Electrical technology	4:Electrical technology	37	38	75	283	0	283	334	0	334	82	774
5: DT	Electronic technology	5:Electronic technology	0	0	0	146	0	146	118	0	118	0	264
6: NL	HVAC technology	6:HVAC technology	0	0	0	99	0	99	29	0	29	0	128
7: HD	Chemical Technology	7:Petrochemical	26	192	218	192	31	223	394	0	394	0	835
PT	Chemical-Analytical	8:Chemical-Analytical	0	0	0	19	0	19	0	0	0	0	19
8: MT	Environment technology	9:Environment technology	0	0	0	127	0	127	0	0	0	0	127
Total			155	230	385	1,362	31	1,393	1,366	0	1,366	82	3,226

(Source: created by information technology department heard from base HUI-TH)

**Chart 3-4: Number of student of Faculty of technology campus HUI-TH divided by each field, each system (as of February 2012)**



(Source: created by information technology department heard from base HUI-TH)

### 3.2.7 The provisions of the dropping out of school

Here are the points that defined the standards for school students to drop out of school

- In cases he/she was absent from school for 3 consecutive semesters
- In case his/her study results were lower than prescribed scale (minimum requirement)
- When she/he requests someone else to take examination for them or he/she take exam for someone else.
- When the time-in-school have exceeded the prescribed time frame<sup>11</sup>

In addition, there are also cases due to personal reasons that the students drop out at midway.

Regarding the examinations of the courses, the undergraduate and professional upper colleges apply the credit system, so students will bear the cost, time by themselves but they could repeat the subjects several times.

Conversely, the vocational upper colleges and professional lower college apply the school year repetition regime there are no dropping out of school standards for them. If failed in the year they may learn along with the following course students.

The table 3-8 indicates the number of students left school in the middle of the Faculty of Technology in 2011 (1 year time). The number of students out of school occupied about 12% of the current student population<sup>12</sup>. The reason many students left school could be attributed to the educational content difficult and harsh lessons (according to information heard from school management).

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<sup>11</sup>. The longest number of years at university is 6 years, 5 years at the upper college level, 3 years for lower colleges and Transitional courses is three years.

<sup>12</sup> Number of students at the table (3-7) is the number of students studying at the time of February 2012, it is difficult to compare it with the number of students left school at the table (3-8). The idea of using these numbers here is to calculate the percentage.

**Table 3-8 : Number of students left school in the middle of Faculty of Technology, HUI-TH 2011 (1 year) for each field, each system**

	Training Unit	University	Upper Professional College	Upper Vocational Colleges	Lower Professional Colleges	Total
1	IT Technology	3	27	42	0	72
2	Mechanical	0	11	35	0	46
3	Automobile Technology	0	18	29	0	47
4	Electrical Technology	0	9	16	0	25
5	Electric Technology	0	11	51	0	62
6	HVAC Technology	0	9	16	0	25
7	Petrochemical	0	16	89	0	105
8	Analytical Chemistry	0	7	0	0	7
9	Environmental Technology	0	5	0	0	5
<b>Total</b>		<b>3</b>	<b>113</b>	<b>278</b>	<b>0</b>	<b>394</b>
Notes: - the Transitional courses no dropped out student in 2011						

### 3.2.8 Teachers

HUI-TH has a number of teachers of 106 people, 3 teaching assistants, and a total of 109 people (as of November 2011).

At the time of February 2012, the teachers of Technology faculty of HUI-TH campus is 39 people. Among them, if excluded 8 people having pursued studying for doctorate program and one person acting as educational service personnel, 2 persons in charge of lab management, the teachers actually teaching are just 28 people. Out sourced faculty (including from the main campus HUI-HCMC) has 10 people, a total of 38 faculty members are involved in the actual teaching as described in Table 3-9. Among the lecturers under HUI-TH, 13 have master's degrees, 15 have a bachelor's degree, but no one has a PhD degree.

Among the teachers hired, there are 9 people with masters degrees, a person with a bachelor's degree, and most of these teachers are teaching in the university system. There is also a teacher in HUI-TH holding a master's degree but is currently not teaching at university system since the university system in the HUI-TH was established recently. Later, the instructors might participate in undergraduate teaching.

**Table 3-9: Number of teachers of Faculty of Technology, HUI-TH campus (February 2012 present)**

Belongs to HUI-TH	39
teaching	28
not always teaching	3
no teaching because studying	8
Secondist (from out of HUI-TH)	10
teaching	10
Total	49
Total: currently teaching	38

(Source: created by information technology department heard from base HUI-TH)

As described in Table 3-10, looking at the number of teachers of faculties, one can see that depending on the faculty but there is faculty which has only one teacher. Compared by field, there is field that has the number of teachers 3 times more than the field average figure (Electrical Engineering), there is field that has the number of teacher less than the field average figure (IT, Chemical and Petrochemical)

**Table 3-10: Number of teachers currently teaching in Faculty of technology HUI-TH campus (person) (as of February 2012)**

Field			Sub Field	Teaching Teachers' Number	Existing Student Number
1	TH	IT technology	1:IT technology	5	371
2	CK, CT	Mechanical	2:Mechanical	7	353
3	OT	Automobile technology	3:Automobile technology	2	355
4	DI	Electrical technology	4:Electrical technology	9	774
5	DT	Electronic technology	5:Electronic technology	1	264
6	NL	HVAC technology	6:HVAC technology	1	128
7	HD	Chemical Technology	7:Petrochemical	12	835
	PT		8:Chemical-Analytical		19
8	MT	Environment technology	9:Environment technology	1	127
Total				38	3,226

(Source: created by information technology department heard from base HUI-TH)

Regarding the teaching subject and faculty, initially the teacher proposes by himself then the school will balance for each teacher about 25-30 teaching hours per week, finally the decision is made. Depending on the actual teaching hours, the income of teachers differs from one to another.

Therefore, teachers tend to request for many teaching hours. According to information heard from faculty

members, the majority of teachers say "do not feel tired when the number of hours taught so many".

### 3.2.9 The curriculum

At the time of February 2012, Faculty of Technology, HUI-TH campus has 23 curriculums as described in Table 3-11

**Table 3-11: List of teaching curriculums of the Faculty of Technology, HUI-TH campus (at February 2012)**

num ber	Sub field	University		Upper College			Lower College
		University	Transitional Course from U. College	Upper College Professional	Upper College Vocational	Transitional from L. College	Lower College Professional
1	IT Technology	○	-	○	-	○	-
2	Mechanical	-	-	○	-	○	-
3	Automobile Technology	-	-	○	-	○	-
4	Electrical Technology	○	○	○	-	○	○
5	Electronic Technology	-	-	○	-	○	-
6	HVAC Technology	-	-	○	-	○	-
7	Petrol Technology	○	○	○	○	○	-
8	Chemical-Analytical	-	-	○	-	-	-
9	Environment Technology	-	-	○	-	-	-

(Source: created by hearing information from the HUI-TH)

In particular, the introduction of the curriculum of professional upper colleges system, the petrochemical industry in the table ().

The Professional Upper Colleges is a training system for 3 years. Each school year has 3 terms so 3 years of study will have nine semesters. The courses are allocated according to the semester, a total of 49 subjects, including 120 credits. Total number of credits accumulated by the minimum required courses and electives is 107 units. Number of subjects coincides with the subject of Akita Technical Upper College is 29 subjects<sup>13</sup>.

<sup>13</sup> In table () have described all the subjects. In comparison in the table (), the subjects compared with subjects taking only the highly specialized ones (40 subjects) should not the same results.

**Table 3-12: The curriculum of the petrochemical industry, professional upper college system-HUI- TH campus**

科目コード	科目名	単位数	履修時間数(注)			秋田高専 物質工学科 類似科目名	科目コード	科目名	単位数	履修時間数(注)			秋田高専 物質工学科 類似科目名
			講義	実習	自己学習					講義	実習	自己学習	
<b>7.1 一般教養</b>		<b>38</b>											
<b>7.1.1 マルクスレーニン主義とホーチミン</b>		<b>12</b>											
<b>必須科目</b>		<b>10</b>											
1	1106121007 Nhung nguven ly co ban sua Chu nghia Mac-Lenin	5	5	0	10		4	1106172117 Practice of inorganic chemistry	2	0	4	4	無機化学実験
2	1106121008 Revolutionary lines of the Vietnam Communist party	3	3	0	6		5	1106172115 Practice of Organic chemistry	2	0	4	4	有機化学実験
3	1106121005 Ho Chi Minh Ideology	2	2	0	4		6	1106171153 Lab technique	1	0	2	2	
<b>選択科目</b>		<b>2</b>					7	1106171157 Analytical chemistry	2	2	0	4	分析化学
1	1106121008 General Law	2	2	0	4		8	1106171132 Computer application in chemistry	2	1	2	4	
<b>7.1.2 社会科学</b>		<b>2</b>					9	1106172065 Physical chemistry-2	3	3	0	6	物理化学
<b>必須科目</b>		<b>2</b>					10	1106025002 Engineering drawings	2	2	0	4	ものづくり実習
1	1106071040 Business Administration	2	2	0	4		11	1106171168 Practice of Analytical chemistry	2	0	4	4	分析化学実験
2	1106101023 General Psychology	2	2	0	4		12	1106172002 Occupational safety	1	1	0	2	
<b>7.1.3 人文科学・芸術</b>		<b>0</b>					13	1106171228 Practical general chemistry 1	1	0	2	2	化学基礎
<b>7.1.4 外国語</b>		<b>8</b>					14	1106172116 Physical chemistry-2	2	0	4	4	物理化学
<b>必須科目</b>		<b>8</b>					<b>選択科目</b>		<b>2</b>				
1	1106111030 Foreign Languages	4	4	0	8		1	1106172088 Measuring and Automation	2	1	2	4	材料計測工学
2	1106173008 English for specific	4	4	0	8		2	1106142056 Electrical technique	2	1	2	4	電気工学概論
<b>7.1.5 数学・情報・自然科学</b>		<b>14</b>					<b>7.2.2 Specialized Knowledge</b>		<b>28</b>				
<b>必須科目</b>		<b>12</b>					<b>必須科目</b>		<b>28</b>				
1	1106131014 Calculus A1	3	3	0	6		1	1106173001 Technology of petroleum refining	3	3	0	6	
2	1106131007 General Physics A1	2	2	0	4		2	1106173008 Technology of gas processing	3	3	0	6	基礎化学工学
3	1106131015 Calculus A2	3	3	0	6		3	1106173147 Petroleum products	2	2	0	4	有機工業化学
4	1106131009 General Physics A2	2	2	0	4		4	1106172088 Heat Transfer Process	3	2	2	6	化学工学
5	1106171045 General chemistry 1	2	2	0	4		5	1106172148 Processes and mechanic equipment	3	2	2	6	
<b>選択科目</b>		<b>2</b>					6	1106173110 Specific Experiment	2	0	4	4	
1	1106131018 Logics	2	2	0	4		7	1106172087 Mass Transfer Process	3	2	2	6	化学工学
2	1106131010 Computational mathematics	2	2	0	4		8	1106173008 Project Practice	1	0	0	3	
3	1106131009 Complex analysis & Laplace transform	2	2	0	4		9	1106172229 Chemistry and physical polymer	2	2	0	4	高分子材料工学
<b>7.1.6 体育</b>		<b>2</b>					10	1106172022 Chemical equipment design	2	2	0	4	化学工学
<b>必須科目</b>		<b>2</b>					11	1106173000 Safety of petroleum environment	2	2	0	4	
1	110621995 Construction Education	2	0	4	4		12	1106173123 Technology of oil Storage and pipe	2	2	0	4	
<b>7.1.7 軍事教育</b>		<b>2</b>					<b>7.2.3 Graduation Practice</b>		<b>5</b>				
<b>必須科目</b>		<b>2</b>					<b>必須科目</b>		<b>5</b>				
1	1106201997 National Defence Education	2	1	2	4		1	1106173982 Graduate Practice	5	0	10	10	卒業研究
<b>7.2 専門科目</b>		<b>104</b>	<b>43</b>	<b>6</b>	<b>92</b>		<b>7.2.4 Thesis or Study Supplements</b>		<b>3</b>				
<b>7.2.1 Knowledge Base</b>		<b>31</b>					<b>7.2.5 論文</b>		<b>3</b>				
<b>必須科目</b>		<b>29</b>					1	1106173224 Project Practice	3	0	0	3	卒業研究
1	1106171060 Inorganic chemistry	3	3	0	6		<b>その他</b>		<b>3</b>				
2	1106172060 Organic chemistry	3	3	0	6		<b>必須科目</b>		<b>2</b>				
3	1106172054 Physical chemistry-1	3	3	0	6		<b>選択科目</b>		<b>0</b>				
							1	1106173123 Technology of oil Storage and pipe	2	2	0	4	
							<b>合計</b>		<b>155</b>	<b>44</b>	<b>56</b>	<b>156</b>	

(注: 講義1時間=1単位、実習2時間=1単位、自己学習は卒業研究など特定の科目のみ単位となる。)

In addition, the curriculum introduces of Professional lower college, petrochemical field and the vocational upper colleges respectively are as in Table 3-13 and Table 3-14.

Table 3-13: Curriculum of professional lower college, petrochemical field

	科目コード	科目名	単位数	秋田高専 物質工学科 科目名 (評価者回答欄)	By Weight	
					LT	TH
<b>7.1 一般教科</b>			<b>20</b>			
<b>必須科目</b>			<b>20</b>			
1	3106111080	English1	4		4	
2	3106031501	Engineering drawing	2		2	
3	3106231995	Physical Education	1.5		1	1
4	3106201997	Military Science exercise	1.5		1	1
5	3106121006	Education of Law	2		2	
6	3106171132	Applied Informatic	2		1	2
7	3106172004	Special English	3		3	
8	3106072040	Business Management	2		2	
合計			18			
<b>7.2 専門科目</b>			<b>55</b>			
<b>7.2.1 Knowledge Base</b>			<b>19</b>			
<b>必須科目</b>			<b>19</b>			
1	3106141061	Electrical technique	2	電気工学概論	2	
2	3106171060	Inorganic chemistry	2	無機化学	2	
3	3106171117	Practice of inorganic chemistry	1.5	無機材料工学・無機工業化学		3
4	3106171050	Organic chemistry	2	有機化学	2	
5	3106171054	Physical chemistry-1	2	基礎物理化学	2	
6	3106171115	Practice of Organic chemistry	1.5	有機合成化学Ⅰ・有機合成化学Ⅱ・ 有機工業化学		3
7	3106171055	Physical chemistry-2	2	物理化学	2	
8	3106171116	Practice of Physical chemistry	1	化学熱力学		2
9	3106172002	Occupation safety	1	ものづくり工作実習	1	
<b>7.2.2 Specialized Knowledge</b>			<b>36</b>			
<b>必須科目</b>			<b>36</b>			
1	3106171157	Analytical chemistry	3	分析化学	3	
2	3106171166	Practice of Analytical chemistry	1.5	材料計測工学		3
3	3106171148	Processes and mechanic equipment	4		3	2
4	3106172098	Heat Transfer Process	3	化学工学	2	2
5	3106172097	Mass Transfer Process	3.5	化学工学	2	3
6	3106172026	Technology of gas processing	3.5		3	1
7	3106172147	Petroleum products	2	有機工業化学	2	
8	3106172031	Technology of petroleum refining	4		4	
9	3106172003	Safety of petroleum environment	2		2	
10	3106172110	Specific Experiment	2			4
<b>7.3 Graduation Practice</b>			<b>6</b>			
<b>必須科目</b>			<b>6</b>			
1	1106172998	Final Engineering Internship	3	校外実習		6
<b>7.4 Graduation Exam</b>			<b>4</b>			
<b>必須科目</b>			<b>4</b>			
1	3106121007	Chinh tri (Politics)	4		4	
合計			50.5			

(注) LT: 講義、TH: 実習)

(Source: Faculty of Technology HUI-TH campus)

**Table 3-14: The curriculum of a vocational upper college system**

No.	Subject code	Subject title	No. of hours	In which	
				Theory	Practice
<b>7.1 Common subjects</b>			<b>630</b>		
<b>Compulsory learning Unit</b>			<b>570</b>		
1	1406121007	Political	60	60	
2	1406131014	Mathematics A1	45	45	
3	1406171132	IT applied in Chemistry	45	15	30
4	1406171228	Practical chemistry	30		30
5	1406172006	English for Petrochemical	60	60	
6	1406131015	Mathematics A2	45	45	
7	1406131007	General Physics A1	30	30	
8	1406111080	English	60	60	
9	1406131008	General Physics A2	30	30	
10	1406171045	General chemistry 1	30	30	
11	1406221995	Physical Educations	60		60
12	1406201997	National Defence Educations	75	15	60
<b>Selective learning Unit</b>			<b>60</b>		
1	1406071040	Business Management	30	30	
2	1406121006	Law Educations	30	30	
3	1406101023	General Psychology	30	30	
<b>7.2. The knowledge of professional education</b>			<b>1230</b>		
<b>7.2.1 Industry Basic knowledge</b>			<b>570</b>		
<b>Compulsory learning Unit</b>			<b>525</b>		
1	1406171060	Inorganic chemistry	45	45	
2	1406172050	Organic chemistry	45	45	
3	1406172117	Practice of inorganic chemistry	60		60
4	1406172116	Practice of Physical chemistry	60		60
5	1406171166	Practice of Analytical chemistry	90		90
6	1406172055	Physical chemistry-2 (Kinetics, Electrochemistry)	45	45	
7	1406172002	Occupational safety	15	15	
8	1406171054	Physical chemistry-1	45	45	
9	1404031502	Engineering drawings	30	30	
10	1406172115	Practice of Organic chemistry	60		60
11	1406171157	Analytical chemistry	30	30	
<b>Selective learning Unit</b>			<b>45</b>		
1	1406172068	Measuring and Automation	45	15	30
<b>7.2.2 Specialized knowledge</b>			<b>660</b>		
<b>Compulsory learning Unit</b>			<b>660</b>		
1	1406173147	Petroleum products	30	30	
2	1406173026	Technology of gas processing	45	45	
3	1406173031	Technology of petroleum refining	45	45	
4	1406173229	Chemistry and physical polymer	30	30	
5	1406173003	Safety of petroleum environment	30	30	
6	1406173110	Petrochemical Experiment	120		120
7	1406172097	Mass Transfer Process	120	30	90
8	1406172098	Heat Transfer Process	120	30	90
9	1406172148	Processes and mechanic equipment	120	30	90
<b>7.3 Graduation practice</b>			<b>300</b>		
<b>Compulsory learning Unit</b>			<b>300</b>		
1	1406173998	Graduation practice	300		300
<b>7.4 Graduation examination</b>			<b>120</b>		
<b>Compulsory learning Unit</b>			<b>120</b>		
1	1406173007	Specialized projects Petrochemical	120		120

(Source: Department of the technology base HUI-TH)



Describe the curriculum of basic and specialized subjects in physics engineering Faculty of Akita Technical Upper College in Tables 3-15 and 3-16 for comparison with the HUI-TH.

Table 3-15: curriculum of basic subjects in physics engineering faculty of Akita Technical Upper College

授業科目		単位数	学年別配当					備考
			1学年	2学年	3学年	4学年	5学年	
必修科目	国語	国語 I A	2	2				
		国語 I B	2	2				
		国語 II	2		2			
		国語 III	2			2		
		日本語表現	2				2	
	社会	現代社会	2	2				
		政治経済	1		1			
		人類史 I	2		2			
		人類史 II	2			2		
		科学技術史	1			1		
		技術者論理	1					1
		基礎数学 I	4	4				
	数学	基礎数学 II	2	2				
		基礎数学 III	2		2			
		微分積分学 I	4		4			
		微分積分学 II	3			3		
		基礎解析	2			2		
		化学 I	3	3				
	理科	化学 II	0		0			
		生物	2		2			
		物理 I	3		3			
		物理 II	1			1		
		教養ゼミナール	1			1		
	体育	保健体育 I	2	2				
		保健体育 II	2		2			
		保健体育 III	2			2		
		スポーツ教育 I	1				1	
		スポーツ教育 II	1					1
	芸術 I	1						
	芸術 II	1	1	1				
	外国語	英語 I	4	4				
		英語 II	4		4			
		英語 III	2			2		
		総合英語 I	2				2	
		総合英語 II	2					2
		英文法 I	2	2				
		英文法 II	2		2			
		英語 LL 演習	1			1		
		英語会話	1			1		
		ドイツ語	2				2	
修得(開設)単位小計		<b>78</b>	24	25	18	7	4	
選択科目	生物基礎	1	1					
	応用化学	0				0		
	社会と文化	1				1		
	科学技術社会史	1				1		
	上級英語	1					1	
	開設単位小計	4	1			2	1	
	修得単位小計		2以上	1以上				
開設単位合計			24	25	18	7	4	必修科目
			1			2	1	選択科目
修得単位合計		<b>80</b>	24	25	18	7	4	必修科目
			2以上					選択科目

(Source: Akita Technical Upper College)

Table 3-16: curriculum of specialized subjects in physics technical Faculty of Akita Technical Upper College

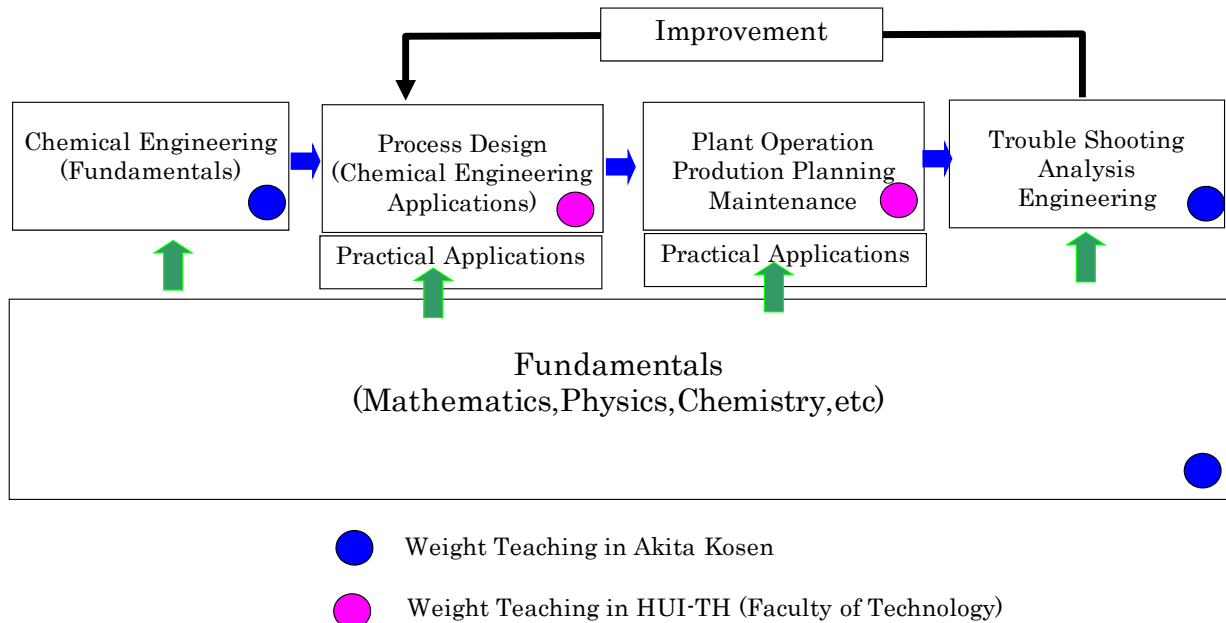
授業科目	単位数	学年別配当					備考		
		1学年	2学年	3学年	4学年	5学年			
必修科目	履修単位	情報処理	2						
		物質工学基礎	2	2					
		科学基礎	2	2					
		ものづくり工作実習	2	2					
		分析化学	2		2				
		有機化学	3		2				
		応用物理 I	2			2			
		無機化学	2			2			
		基礎物理化学	2			2			
		生物化学	2			2			
		天然物化学	1			1			
		基礎化学工学	1						
		錯体化学	1				1		
		電子化学	1				1		
	材料計測工学	1					1		
	工業英語	1					1		
	分析化学実験	2		2					
	有機化学実験	2		2					
	無機化学実験	2			2				
	生物化学実験	2			2				
	基礎研究	2				2			
	卒業研究	9					9		
	学修単位	化学熱力学	2			2			
		物理化学	2			2			
		応用微生物学	2			2			
		無機材料工学	2				2		
		プロセス工学	2				2		
		無機工学化学	2				2		
		反応工学	2				2		
応用解析 I		2			2				
応用解析 II		2			2				
応用物理 II A		1			1				
有機合成化学 I		1			1				
有機合成化学 II		1				1			
化学工学		2			2				
有機工業化学		2				2			
物理化学実験		2			2				
機器分析実験	2			2					
化学工学実験	2			2					
修得(開設)単位小計	77	8	8	15	25	21			
コース科目	物質コース必修	学修単位	量子化学	2				2	
			固体化学	1			1		
			無機合成化学	1			1		
			高分子材料工学	2				2	
	修得(開設)単位小計	6				2	4		
	生物コース必修	学修単位	遺伝子工学	2				2	
			生物化学工学	2			2		
			欠リ物質工学	2				2	
	修得(開設)単位小計	6				2	4		
	共通選択科目	履修単位	火口ロックス	1				1	
			品質管理	1				1	
			医薬品工学	1				1	
			環境工学	1				1	
			校外実習A	1			1		
校外実習B		2			2				
学修単位		応用解析 III	1				1		
		応用物理工学	1			1			
		食品化学	1				1		
開設単位小計		10				4	6		
修得単位小計	4				4				
専門科目開設単位合計	93	8	8	15	31	31			
専門科目 修得単位合計	87	8	8	15	27	25	必修科目 選択科目		
一般科目 修得単位合計	80	24	25	18	7	4	必修科目 選択科目		
修得単位合計	167	32	33	33	34	29	必修科目 選択科目		

(Source: Akita Technical Upper College)

Table 3-5 describes the list of training contents required for heavy industry and petrochemicals. The chemistry, physics, math...is the basic science knowledge of training content required for heavy industry and petrochemicals. And of subjects that use this basic knowledge is Applied chemical engineering such as basic chemical engineering, process design, etc... maintenance and operations techniques planning, problems shooting.

If sketching the content being taught in Faculty of Technical physics of Akita Technical Upper colleges and petrochemical industry in the HUI-TH campus, one can see the Akita Technical Upper College teach the basic sciences, the basic chemical engineering, abnormal situation treatment, while HUI-TH teaches practical subjects, applications such as chemical engineering applications, technical maintenance operations plan.

The reason why the Akita Technical Upper College does not teach chemical engineering application maintenance and technical operation plan because in Japan, this is the part of training to be conducted by enterprises after recruitment. For the case of Japanese firms to expand into Vietnam, educational content that these firms expect the education establishments to provide are the basic sciences chemistry, physics, mathematics and basic engineering chemistry, the HUI-TH campus needed to strengthen the educational content focused on theory.



**Chart 3-5: Comparison of priority areas of Akita Technical Upper College and HUI-TH on the basis of content of training required for heavy industry and petrochemicals**

(Source: created by ADAPTEX)

### 3.2.10 Timetable

Each learning hour lasts 45 minutes, and one day has 16 hours.

Method of Converting Credit: <sup>14</sup> 1 credit of the theoretical part is equivalent to 15 learning hours (hour), 1 credit of practical part is equivalent to 30 hours. The self-study time are converted to the total number of practical hours, but not be converted into credit (in special cases when this is allowed, one can convert a credit / 15 hours), and this is not subject to self-assessment or report.

Learning hours are divided into 2 types' theory and practice<sup>15</sup> according to Table 3-17 and Table 3-18, 5 hours of practice makes a shift. The time table of each term is determined at the beginning of the year.

**Table 3-17: Time table for theoretical lectures in HUI-TH**

Morning		Afternoon		Evening	
Hour	Time	Hour	Time	Hour	Time
1	7:00 to 7:45	7	13:00 to 13:45	13	18:15 to 19:00
2	7:45 to 8:30	8	13:45 to 14:30	14	19:00 to 19:45
10 minute break time		10 minute break time		10 minute break time	
3	8:40 to 9:25	9	14:40 to 15:25	15	19:55 to 20:40
4	9:25 to 10:10	10	15:25 to 16:10	16	20:40 to 21:25
10 minute break time		10 minute break time			
5	10:20 to 11:05	11	16:20 to 17:05		
6	11:05 to 11:50	12	17:05 to 17:50		

(Source: according to information heard from HUI-TH)

**Table 3-18: Hours of practical subjects in HUI-TH**

Shift I		Shift II		Shift III	
Hour	Time	Hour	Time	Hour	Time
1 – 5	7:00 to 10:45	6 – 10	13:00 to 16:45	11 – 15	18:00 to 21:45
No break time		No break time		No break time	

(Source: according to information heard from HUI-TH)

### 3.2.11 Evaluation of textbooks and syllabuses used in HUI

The textbooks and syllabus of the Akita Technical Upper College have been used to evaluate the textbooks and syllabuses currently used in the HUI and the results were summarized.

#### 3.2.11.1 Assessment Method

<sup>14</sup> Applicable for university, professional upper colleges. For vocational upper colleges and professional lower college should not be converted into "credit" but use "hour".

<sup>15</sup> All subjects consist of theory part and practice part.

Thanks to the cooperation of the Akita technical upper college the following two contents were assessed

- (1) Evaluation of textbooks (10 textbooks have been provided by HUI-HCMC were reviewed)
- (2) Evaluate the training program (assessments of the training level of training programs)
- (3) Compare the content of same training programs (comparing the same courses of three training programs)

Here are 3 results of this survey. Assessment 1 and assessment 2 were made by the method of scoring using the form filling 1.0 to 4.0 accurate to one digit after the decimal point and answer. Assessment 3 was done by the method of completing the corresponding subject or fill round mark.

- (1) The results compare textbook evaluation (evaluation results of 10 textbooks)
- (2) The results of training evaluation (results of third-degree assessments of 3 training programs)
- (3) The results comparing the same number of learning subjects of training programs (the same percentage of subjects in the three training programs)

Sample textbooks as objects to be evaluated from the HUI-HCMC campus, but in HUI-TH are also using the same textbooks should be regarded as a textbook for use in HUI-TH. Titles of books are described in Table (3-19). Curriculum subjects rated were the curriculums of the HUI-TH (Thanh Hoa campus), and circle symbol denotes program having subjects that are using textbook being evaluated object<sup>16</sup>.

**Table 3-19: List of textbooks and training programs are being used**

No.	Text Title	Curriculum		
		University	Upper Professional College	Lower Professional College
1	Oil & Gas Products(Theory)			○
2	Gas Processing Technologies	○	○	
3	Gas Processing Technology(Theory)			○
4	Refining Technologies	○	○	○
5	Chemical Theoretical Basis Analytical 1			○
6	Catalysis for oil refining process(Theory)	○		
7	Equipment Process Heat Transfer			○
8	Process & Equipment Mass Transfer			○
9	Calculate & Design Parts of Chemical and Oil & Gas Equipment	○		
10	Theoretical basis of analytical chemistry 2			○

*(Source: created by the survey results)*

<sup>16</sup> Created based on information used textbooks in the subject, in HUI-HCMC (faculty of HUI- HCMC marked). There are also textbooks used in many programs.

Below is a specialized field of those who answered the survey.

Reviewer A - Inorganic Chemistry, material processing

Reviewer B - Chemical Engineering

Reviewer C - Chemical analysis, resource recycling technology, inorganic chemistry, chemical engineering

### 3.2.11.2 Results (synthesized assessment)

#### (1) Evaluation of textbooks

As described in Table 3-20, the textbooks are always rated as the equivalent level of technical upper college (the equivalent level of 3.0 points). In addition, the content of textbooks No. 9 entitled "Calculation & Design of Chemical coupling & Valves", also known as "design management of technical equipment", is regarded as a subject of Faculty of mechanical engineering rather than a subject of chemical materials technology.

**Table 3-20: Results of textbooks evaluation**

(Unit: Points)

	No.1	No.2	No.3	No.4	No.5	No.6	No.7	No.8	No.9	No.10	
Q1	Name of subject	-	-	-	-	-	-	-	-	-	
	Required	○	○	○	○	○	○	○	×	○	
Q2	① Accuracy	3.0	3.0	3.0	3.0	3.0	3.0	2.5	3.0	-	2.5
	② Level of text contents	3.0	2.9	3.0	3.0	3.0	3.0	3.0	3.1	-	2.3
	③ Ease of textbook understanding	4.0	2.3	4.0	3.0	2.0	3.0	2.4	2.5	-	2.4
	④ Number of lecture times	3.0	3.8	2.0	4.0	2.0	4.0	2.5	3.0	-	3.0
	⑤ Number of practical times	4.0	3.8	2.0	4.0	2.0	4.0	3.0	2.7	-	3.2
	Comprehensive evaluation	3.4	3.1	2.8	3.4	2.4	3.4	2.7	2.9	-	2.7
Q3		3.0	3.0	3.0	3.0	3.0	2.5	3.0	3.5	3.0	2.0

(Source: created by evaluating the content of textbooks and training programs)

#### (2) Evaluate the training program

Here describes the evaluation results of the training program of HUI-TH as described in Table 3-16. Results show that except the university system, the content of the training program of HUI-TH is rated less than training program of the Faculty of chemical materials technology of the Akita Technical Upper College (the equivalent level of 3.0 points).

**Table 3-21: Results of training programs evaluation**

(Unit: Points)

University	Upper Professional College	Lower Professional College
3.3	2.6	2.3

(Source: created by evaluating the content of textbooks and training programs)

(3) Comparison subject between the programs

The subjects to be compared are subjects in the curriculum of the HUI-TH regardless they are specific subjects of Vietnam or basic subjects, professional subjects, which only compares the subjects highly specialized. Therefore, subjects in the comparison of training program consists of 51 undergraduate subjects, 40 subjects of the professional upper colleges system, 21 subjects of professional lower college system.

Table (3-22) shows the results of the subject comparison of the three training program in HUI-TH and courses of training programs in the Faculty of chemical materials engineering of Akita technical upper colleges, 35 subjects of the university system, 25 subjects of professional upper colleges, 15 subjects of the professional lower college in HUI-TH. The result is that they are being used in schools of Akita professional engineering, or the Akita technical upper college also has the equivalent subjects. The results show that all training programs have over 60% of subjects which are also available in programs of the professional technical schools of Akita.

**Table 3-22: Comparison of subjects that are being used at Akita Technical Upper College of the highly specialized subjects of the HUI-TH (according to each system)**

	University	Upper Professional College	Lower Professional College
The number of objective subjects in HUI-TH (Subject number)	51	40	21
The number of subjects overlapped in Akita KOSEN and HUI-TH (Subject number)	35	25	15
The percentage of subjects overlapped (%)	68	62	71

(Source: created by evaluating the content of textbooks and training programs)

### 3.2.11.3 Comments from evaluators

There are following comments referring to content of textbooks.

- Lack of explanation content of student questions such as just described with the formula without interpretation, etc.
- There are contents such as detailed explanations for operating machinery, etc...Which are rather the operation manual than theoretical contents?

- Depending on the textbook it was found to have the description error, lack of accuracy.

However, the content in textbooks is considered to have equivalent levels, good or slightly better than the content of school textbooks in technical professional colleges. In addition, depending on the type of textbooks, there are approaching contents which are not found in the Akita Technical professional schools.

Also it was suggested that there are some elegant and practical content. From the further investigation, it has also found that the textbooks might be used in the different training programs; each training program will use deferent part of the same textbook.

It could be said the utilization of textbooks with content suitable for students with different education levels, and use the same textbook content to students with different levels of education should cause some issues from the effective completion of the course. In addition, according to the results described in (2), the training programs of the university system are estimated to have equivalent levels of Akita professional technical schools, the training programs of the professional upper college- and professional lower college are assessed to be of lower levels than the level of Akita professional technical school.

In particular, it has been suggested that the reason for lower level could be attributed to the fact that there were not enough learning time for basic subjects and pratical subjects. In case of professional lower college system, it was also suggested that the overall number of school hours too few for the students to grasp the required knowledge. Also, it is suspected that consistency with learning time has not been fully considered, and it needs a structure allowed teacher to conduct teaching in several faculties.

#### **3.2.11.4 Assessment summary**

From the above mentioned comments and results of assessment, it can be said that the textbooks level is equivalent or slightly better than that of Faculty of chemical materials engineering of the Akita professional technical school, but there were still limitations in the textbooks content which need to be improved. In particular, the content of similarity with operation manual has been rated and evaluated, which is totally different from the ones being taught in Akita professional technical schools. However, there are textbooks for teaching that is taking the approach different from Akita professional technical schools. Therefore just promote this good point, and reviewing to narrow the distance between the two systems can make a textbook that can be used to teach in an effective way.

In contrast, for the training program, we can say the problem has emerged after confirming the content of textbooks the following changes could have to be done the learning time or the teaching methods depending on each case. On training content, need to change the mindset focusing on practical application (How To) into focus theory, and need to improve teaching (Teaching Method) of the faculty.

The biggest results obtained through this assessment related to way of thinking and training methods that may or may not be sufficient to teach all subjects with the current number of hours, and whether this



can help students fully understand the textbook content or not. Just thru a cited textbook being objects for this assessment, it can also be found that the teaching content contained too many items. With such contents, Akita Technical Upper College has to teach over the years or that content included also in the curriculum of other faculties. Therefore, careful selection of subjects or reallocation of class time, theoretical lectures, practice, experimentation, including the teacher structures involved in teaching in many faculties need to be considered before consideration to the content of textbooks.

**3.2.12 Compare rates (%) between basic subjects with specialized subjects**

Comparison was done by conversion of percentage rate of basic subjects and specialized subjects, the basic training and the practical application of the subjects of the petrochemical field of the Faculty of technology from “credit” into the “amount of time” (not hours) and compare that results.

Table 3-6 explains how to sort before getting the results. In these subjects there are basic subjects and specialized subjects. And each subject consists of two parts, basic theoretical part and practical applications of learning or practice. The practical application is divided into experimental and practical.

		Portion in each Subjects		
		Fundamental	Practical Application	
Subjects	General Subject	Theory, Principle	Experimental	Practical Training
	Professional Subject	Theory, Principle	Experimental	Practical Training

**Chart 3-6: Way of thinking about the study content of the subjects**

(Source: Unico International JSC)

This time, was conducted comparing the total number of school (each year) of Akita Technical Upper College and university system, the professional upper colleges, the professional lower colleges of Faculty of Technology, HUI-TH campus, and comparison % rate of basic subjects with specialized subjects, the percentage rate of the basic training and the practical applications.

It was intended to do the comparison in schooling units-the number of hours from the difference between system, but a school hour at Akita Technical Upper College is 50 minutes, while a school hour in HUI-TH is only 45 minutes, one should not conduct a simple comparison like that. Therefore, the comparison was carried out by school time converted into real time (in 60 minutes) and then calculates the percentage. As

a result of comparing the total number of school hours in a year table 3-23, the Akita Technical Upper College has the most school time of 815.7 hours. In HUI-TH, the professional lower college with the biggest number of 663.8 hours, the professional upper colleges have the least of time.

As a result of the comparison of rate between basic and specialized subjects, Akita Technical Upper College has the highest percentage of basic subject of 49.1%. In the HUI-TH, a fundamental subject rate of the university system is 38.3%, and decreasing numbers in order of each system.

As a result of comparison between the rate of basic training and the practical applications, it was unknown rate of fundamental subject at Akita professional technical schools, but the rate of specialized subjects was of 6.3 / 3.7. In the HUI-TH, the basic training appeared the most in the university system reached only 4.8 / 5.2. As a result of the comparison between the HUI-TH systems, compare the results of total basic subjects and specialized subjects, the system having the most number of basic training is the professional upper colleges with the rate of 6.1 / 3.9, less than at the vocational upper college rate of 4.3 / 5.7 and the professional lower college at a rate of 4.4 / 5.6.

**Table 3-23: Comparison between the rate of basic subjects and specialized subjects, the basic training and the practical application of the Akita Technical Upper College the petrochemical field in HUI-TH**

	Hours Ratio (%)	HUI-TH									
		Akita National College of Technology (5 years)		University (4 years)		Upper Professional College (Petrochemical) (3 years)		Upper Vocational College (Petrochemical) (3 years)		Lower Professional College (Petrochemical) (2 years)	
		Fundamental	Practical Application	Fundamental	Practical Application	Fundamental	Practical Application	Fundamental	Practical Application	Fundamental	Practical Application
General Subject	in each	-	-	75.7	24.3	87.0	13.0	71.4	28.6	66.7	33.3
	Total	49.1		38.3		35.9		27.6		20.3	
Professional Subject	in each	62.7	37.3	47.9	52.1	46.3	53.7	32.7	67.3	38.3	61.7
	Total	50.9		61.7		64.1		72.4		79.7	
Total	in each	-	-	58.5	41.5	60.9	39.1	43.4	56.6	44.1	55.9
	Total	100		100.0		100		100		100	
Lecture Times per Year		815.7		542.8		480.0		570.0		663.8	

(Source: Akita Technical Upper College in 2010, documents provided by the HUI-TH)

### 3.2.13 Tuition fee

Tuition fee in the credit system as undergraduate or professional upper college is counted per number of credits. The tuition fee of the vocational upper college and professional lower college is counted in

months. The tuition fees are collected at the beginning of each semester. Semester 1 starts in September, semesters two starts in December, and semester 3 starts in March.

- University system, professional upper colleges: 1 credit = 105,000 VND. For example, the undergraduate system of petrochemical field (4 years) is calculated with 155 credits. Tuition fee for the whole year is calculated as follows (as of January 2012):  $105,000 \text{ VND} \times 155 \text{ credits} \div 4 = 4,068,750 \text{ VND}$  (about 196 USD, equivalent to 15,000 yen)
- The vocational upper colleges System, professional lower college: tuition fees monthly from 350 to 400 USD. Because tuition fee is collected for each semester, so if a year has 10 months of school, tuition fees will be calculated as follows:  $400,000 \text{ VND} \times 10 \text{ months} = 4,000,000 \text{ VND}$  (about 193 USD, equivalent to 15,000 yen)

Tuition fees for one year are almost the same for different systems<sup>17</sup>.

Because of the tuition fees of public and national universities are regulated by ceiling value, (see Section 2.2.5.4), so in spite of the autonomy or responsibility, self-management matter (see Section 2.2.5.3), the school can not raise the tuition fees as it likes, the only way is to increase number of students. However, depending on the facilities, teaching equipment, number of faculty members that an increasing number of students has its limits.

### 3.2.14 Scholarships

In the HUI-TH for scholarship application there are following 3 types:

- (1) Scholarships for students with excellent performance: 15 people per year. Depending on the achievements of the year (GPA<sup>18</sup>) it is subjected to tuition fee deduction.
- (2) Scholarships for students with economic difficulties: 10 people per year. The application is submitted in each semester. Where there are several applicants, it will evaluate the study achievements. Annual tuition fee will be reduced to one third of the tuition in one semester.
- (3) Scholarships for students with economic difficulties provided by the enterprise: 30 people per year. Scholarship amount is 500,000 VND / 1 person. There are five companies currently grant for the school which are: Thanh Hoa insurance companies, Agribank branch of Thanh Hoa, Lam Son Sugar Company, Viettel, Thanh Hoa Post insurance company. The amount of money provided is different from business to business. The total amount of scholarships offered by the current business quite little of just 15 million VND (700 USD). Students receiving such kind of scholarships are selected by the school.

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<sup>17</sup> According to a 2009 report, the tuition fee of majority of public universities is 240,000 VND / month, 2.4 million VND / year. For some schools, there is also the additional necessary costs total of 3,520,000 VND / year. In case of private schools, there are cases where school fees of up to 9.3 million VND (public university of engineering and technology).

<sup>18</sup> GPA = Grade Point Average

In addition, there is also tuition fee exemption system which is valid for wounded soldiers and their children. This case needs to reside in a province of 1,000 appointed provinces and must have a certificate.

### **3.2.15 Graduation and Employment**

At the time of graduation, if the attendance rate is below 80%, students can not participate in graduation examination. The rate of dropping out is high, only about 70% students in school until they graduate (an interview in HUI-TH).

In the HUI it was set up "graduate evaluation criteria", and now is trying to provide graduates information clearly to the person in charge of corporate recruitment. The graduating evaluation is done by 3 parties e.i. the teacher, the evaluators, and examination organizers.

Students of Undergraduate and professional upper colleges systems have to do graduation thesis, students of the vocational upper college have to take-graduation examination. Depending on the graduation examination there might be essay, test (paper test or test on computer), graduate internships, etc ... It is permitted to retake exams until the second semester.

Upon graduation, English language ability is required as follows: The professional lower college, the vocational lower college: level A, the professional upper colleges, the vocational upper colleges must reach the level B, the university (Transitional system) to reach the level C

On the other hand, also similar qualification in IT is required. If not achieved this level at the main campus one may be studying English at the language center of HUI, studying IT at IT center in the school. On the treatment way in HUI-TH, now the main campus is preparing.

Graduation time is in July every year. If then the students can not graduate or do not graduate, the students may want to get more credit and they expect to graduate in the next semester (in December).

Most students graduated from professional upper colleges, vocational upper colleges, professional lower college desire to proceed to the Transitional system. At the time of November 2010, approximately 70% of graduates of vocational lower college system proceed to vocational upper college Transitional.

In 2011, it was the first year with graduates of lower college (entered in 2008). But after graduation the students have to find work by themselves, so the school does not capture the information on their workplace, except the case when the enterprises themselves went to school to recruit. For graduates in 2011, the school knows only work information of the case where the enterprise went to school before graduation.

There are 9 people graduate from upper college (electrical), 24 people from lower college (electrical), 25 from lower college (electronics) have been employed at the Samsung Company (Korea). There were 10 graduates from a upper college (electrical), and 7 lower college graduates (electrical) were recruited to work in General bridges construction company No 18 - Cienco 1 (Vietnam).

### 3.2.16 Dormitory, other systems

Within the HUI-TH campus there are dormitories for men and women separately. Dormitory fee of each student is 150,000 VND / month (about 563 yen), furnished and equipped including electricity, water. The canteen was also built on campus. Currently (at the end of May 2011), among total 7,330 students 2,570 students are living in the dormitory.

The time limit in dormitory is one year, after the first year students on campus must apply again. First-year students are given priority on dormitory.

These students that can not enter the dormitory neither could not go to school from home would rent houses near the school. Rent cost is nearly doubled in the dormitory fee and they have to cook.

Every year, students are involved in activities such as festivals, sports competitions, camping, travel, etc...

#### 3.2.17 The survey conducted on attitude of students and teachers

##### 3.2.17.1 Student

Survey methodology: They have conducted focus group discussions (GD) for the following groups:

- ① A group of five students of the University system, in which two students petrochemical industry, two students of information technology, one mechanical engineering student.
- ② Two groups of the professional upper college students, each group with 2 students petrochemical industry, one mechanical engineering student, one student of Electrical Engineering, one student of environmental engineering, total each group 5 students.
- ③ A group of vocational upper collegestudent and field classification is similar ②
- ④ Two groups of professional lower students, and field classification is similar ②

##### (1) Why choose HUI-TH

The object to get information is students originated from Thanh Hoa province. Selection due to school being closer to home is the reason most popular. Additionally, there are cases for reasons such as good teaching equipment, good teaching methods of good teachers, etc ... they chose HUI-TH campus after seeing ads on TV or be friends, relatives or older people advice. Most of the University students choose HUI-TH since they could not be able to enter the university being as the 1<sup>st</sup> option. The professional upper college students chose the HUI-TH as they did not pass the exams to enter into University. However, regarding the students at lower levels than upper college, they chose HUI-TH campus because they think is better than others.

##### (2) Reasons for selecting the training system

UEE scale required for admission arranged in order from top to bottom is the University, the

professional upper colleges, the vocational upper colleges, professional lower colleges.

Much of the reason for system selection is that he/she has not reached into the higher system, which can be seen that the system division is based on achievement. There are also students who selected lower colleges system since for just 2 years that they were able to work, or for UEE exam he/she has not passed for a few years or family circumstances do not allow. The age of the lower college's students is the highest; some of them are 26, 28 years old.

- (3) Awareness of the differences between the professional system and vocational training system  
Prior to admission they did not think it any different. At the time of 2008, the HUI-TH campus had only professional system for both upper and lower colleges; they have chosen the professional with unclear reasons. In addition, there are also students who selected the professional system, thinking that with higher entrance requirement for professional, in future they may be switching to Transitional system for higher degree.

There are also students who selected the professional system despite they thought that it could be easier to apply for a job due to structure more focused on the practical side of the vocational system, but because their parents recommended them so they chose a professional system finally. And there are also that students who graduate professional system by thinking they can apply to do office work, and they would have no other option than work at field if they could select the vocational system.

It was understood after admission that the number of subjects of the two systems is similar, but content might be different. Even using the same textbook, but the content is different.

- (4) Reasons for choosing the petrochemical field

In Vietnam, there is very few school subjects related to oil. Most of the students selected Petrochemical field as they know Nghi Son oil refinery will be built and they want to work in factories. There are also students who selected the industries as they like chemistry.

- (5) The dissatisfaction with the school

The satisfaction with the school is rather high, but here will list out the points of dissatisfaction of students toward school.

- There are times when they find the school day too long, from early morning to late evening.
- There are documents, given by teacher as reference, but they are not available in the library
- Depending on subjects, some times they feel the student overcrowded.
- The outsourced teachers try to complete contents of one semester within 1 to 2 months some times they found it difficult.

- Sometimes the timetable is unreasonable. Some times the school is too much; sometimes it does not have any class.
- Students of Transitional systems have classes in the evening hours, Saturday, Sunday and they have to work in working days. Sometimes they feel tired and difficult.
- Tution fee (compared to other similar schools) is high.
- If the damage to experimental tools takes place, the students have to pay.
- Laboratory equipment and Chemicals are supplied by the HCMC office, but some times they have to wait for a long time.
- Do not use the projector with theoretical learning.
- Lacking the devices used in extracurricular activities (volleyball, tennis, badminton, etc ...)
- Even being students from Thanh Hoa province, but for some students it is so far so they need to stay in dormitory which is available for a year only, for the rest they had to rent out. Rent cost outside is many times more expensive than in the dormitory. On the other hand, it takes time to cook so they find it very difficult.

(6) The other detected points

- The upper schodary school includes public schools, semi-public schools and private schools in which the level of public schools is the highest among the students interviewed the rate of student succesful to the University after graduating from public secondary schools is very high from 10 to 60%. The level of semi-public and private schools are the same, but typical of private schools is no entrance examination and equipment and teaching facilities are well. In 2009, semi-public schools have been merged into public schools.
- When asked to explain the contents of the work of engineers and technicians, received the answer the engineer work content is the management of engineering, design, operations, technology transfer, research, also work content of the technician is performing the work indicated as maintenance, operation of machinery, equipment, etc ... students are realizing that the gap between the two contents.

### 3.2.17.2 Teachers

Survey methodology: Group discussion was conducted for two groups of faculty members include 11 people, including 10 people under the Faculty of technology HUI-TH campus, 1 lecturer from the HUI-HCMC office.

(1) For the job in HUI-TH

- Joined by applying after has heard from friends, acquaintances, siblings, or predecessors ever worked in the HUI-TH, or recommenred by their teachers when attending school, or watch online, and see the HUI-TH having the field of engineering with a good environment for teaching. The reason most wanted is to teach in schools closed to their houses. Among the 28 faculty members affiliated in Faculty of technology, except for one who came from a near by province, all the rest are from Thanh Hoa. Among the faculty group of respondents, there were some who graduated from polytechnical universities in Hanoi or Ho Chi Minh City but returned to teach in the Thanh Hoa.
  - The recruitment of teachers was conducted in all the year round. When selected, it will be based on evaluation, academic achievement and University examination results to evaluate teaching qualifications.
- (2) Teaching hours, student's number, objects training system, etc.
- Regarding the subjects will be taught: first teachers choose 2, 3 subjects, and then Faculty management will adjust so that each teacher teaches about 22 to 30 hours in a week.
  - No comments on so many hard hours of teaching (note: then heard from the Faculty management, that salary will be determined based on the number of teaching hours, so conversely, the faculty who wish passionate about increasing teaching time).
  - There are faculty members from the main campus HCMC, Quang Ngai campus, Thai Binh campus teaching in HUI-TH. Their time in school is between 2 and 3 weeks to 2 months. If the same industry, it is also possible that teachers attend lectures together.
  - Regarding the theory part, they conduct lectures for over 80 students. As for practice, each class has about 25 to 30 students. → a young lecturer polytechnic graduates said that in his own studentship, the class was subdivided into 5 groups and each group will have a direct supervisor for practice, experiment.
  - Teachers teach in different systems do not find it difficult.
- (3) Training philosophy, training methods
- In the context of each system, there are people who want to proceed to the Transitional system, there are people who want to work, teachers' answers to the question "How the training of graduate students like?" is just teach following the curriculum and there is no "special principle of training".
  - The instructor does not orginize for his own team.
  - Teachers newly hired will undergo training period for training methods from 3 to 6 months.
  - Workshop aiming to enhance the training methodology is done each year 1, 2 weeks to 2 months



HUI-TH. Lecturer of such seminar was a lecturer at the main campus HUI-HCMC.

- There are also training courses to have knowledge related to new technologies. Mainly content of new teaching equipment was imported from US...
  - Regarding the relationship with businesses, teachers will contact the businesses that have a personal relationship and requests to receive student practice or for visits, etc. ..., then teachers themselves will lead students to which the school does not interfere with anything. There are many teachers have more social experience, with many relationships, but there are also the teachers is not the case
- (4) The difficulties, the desires to improve
- Commented on the number of students, sometimes the teachers find it with too many students they can not cover it all, find it difficult (especially young teachers).
  - In the past in Vietnam does not have refineries, teachers have not ever seen, they currently are teaching on the job at the refinery. So they feel difficult.
  - Need the latest teaching equipment. Need a budget for it.
  - Need to increase the number of teaching facilities.
  - To tighten the standards for admission of students, and selected only the best students in school.
  - Recommend the school management responsible for contacting enterprises.

### **3.2.18 Equipment taught in HUI-TH**

It was implemented a comparison of training equipment of the HUI-TH and Akita technical upper colleges focus on the subject of oil refining, petrochemicals. The Petrochemical field of Faculty of technology of HUI-TH has as training facility typically as follows (Figure 3-7):



Refinery tower model



Air exhaust tower model



Heat exchanger model

***Figure 3-7: Example of a training facility of the petrochemical industry scientific-technological basis***

***HUI TH***

*(Source: created by Unico international JSC)*

**Table 3-24: List of teaching equipment in petrochemical Field, Faculty of Technology, HUI TH**

No.	Type	Equipment title	Origin	Unit	Q'ty
217	実験装置 (減圧蒸留)	Vacuum distillation apparatus - ASTM D1160 - BRINSTRUMENT - Model: D1160M [MANUALLY OPERATED SYSTEM]	VN	EA	1
230	機器 (コーン貫入試験器)	[Cone Penetration of Lubricating Greases] - ASTM D217 - KOEHLER - Model: K95590 -	VN	EA	1
226	機器	[Determination of Sulphur and Chlorine] - ASTM 1551 - PETROTEST	VN	EA	1
228	機器	[Heat of Combustion] - ASTM D240 - KOEHLER - Model: K88890	VN	EA	1
211	機器 (計量器)	analytical Weight Model: Sartorius Model: CPA324S S/N: 23901422	VN	EA	1
19	機器 (計量器)	analytical Weight Model: Sartorius Model: CPA324S S/N: 23901446	VN	EA	1
120	機器 (pHメーター)	table MEASURING PH -meter Model: Sartorius Model: Docu-PH+/12 S/N: 24053252	VN	EA	1
121	機器 (pHメーター)	table MEASURING PH -meter Model: Sartorius Model: Docu-PH+/12 S/N: 24053260	VN	EA	1
218	機器 (銅片銀片腐食試験器)	Equipment corrosion of copper and silver plates ASTM D130 -KOEHLER / Model: K25319 [Copper and Silver Corrosion Apparatus]	VN	EA	1
219	機器	Measurement of the density of petroleum products - ASTM D1298 -KOEHLER - Model: K26490 / [Specific Gravity of Petroleum Products]	VN	EA	1
229	器具	[Hydrocarbon Type in Liquid Petroleum] - ASTM D1319 -KOEHLER - Model: K41592 -	VN	EA	1
227	器具	[Saybolt and Saybolt Wax Chromometers] - ASTM D156 -KOEHLER - Model: K13009	VN	EA	1
248	実験装置	absorption Experiment	VN	EA	1
133	機器	Air conditioner REEETECH 1,5HP RT12BM2 Văn phòng 3B05.03	VN	set	1
212	機器	Air conditioner REEETECH 2,5HP RT/RC24BM 2	VN	máy	1
213	機器	Air conditioner REEETECH 2,5HP RT/RC24BM 2	VN	máy	1
214	機器	Air conditioner REEETECH 2,5HP RT/RC24BM 2	VN	máy	1
69	器具	Alcohol light -China	VN	EA	50
70	器具	Alcohol light -VN	VN	EA	7
72	器具 (石棉ネット)	amiang net 20*20 -China	VN	EA	200
35	器具	Becher 1 lit - Germany	VN	EA	10
30	器具	Becher 100ml-Germany	VN	EA	100
36	器具	Becher 2 lit - Germany	VN	EA	10
31	器具	Becher 250ml - Germany	VN	EA	50
37	器具	Becher 3 lit - China	VN	EA	10
32	器具	Becher 500ml - Germany	VN	EA	50
34	器具	Becher 50ml-Germany	VN	EA	49
33	器具	Becher 600ml-Germany	VN	EA	50
40	不明	Binh Wutz 200ml (spheres 2 cỡ) - Germany, Anh	VN	EA	15
62	器具	Brown glass bottles 100ml-China	VN	EA	50
73	器具	Brushes wash flask-VN	VN	EA	100
80	器具	Buret khóa nhựa 25ml-Anh	VN	EA	20
55	器具	Buret plastic lock 25mlx0.1 - Anh	VN	EA	15
231	機器 (エアキャビネット)	CABINET air toxic	VN	EA	1
238	機器 (エアキャビネット)	CABINET air toxic	VN	EA	1
247	機器 (エアキャビネット)	CABINET air toxic	VN	EA	1
275	機器 (エアキャビネット)	CABINET air toxic	VN	EA	1
284	機器 (エアキャビネット)	CABINET air toxic	VN	EA	1
294	機器 (エアキャビネット)	CABINET air toxic	VN	EA	1
304	機器 (エアキャビネット)	CABINET air toxic	VN	EA	1
175	機器 (エアキャビネット)	CABINET air toxic.	VN	EA	1
192	機器 (エアキャビネット)	CABINET air toxic.	VN	EA	1
203	機器 (エアキャビネット)	CABINET air toxic.	VN	EA	1
222	機器 (残留炭素計測装置)	Carbon residue Control Equipment - ASTM D189 - KOEHLER / Model: K80030 / [Conradson Carbon Residue Apparatus]	VN	EA	1
147	器具 (遠心分離器用スピッチ)	Centrifuge tubes vinyl 15ml có nắp-Germany	VN	EA	50
202	機器 (遠心分離器)	Centrifuge vitro Model: Hettich Model: EBA-20 S/N: 0088764	VN	EA	1
22	機器 (遠心分離器)	centrifuge Model: Hettich Model: EBA-20 S/N: 0088811	VN	EA	1
66	器具	Ceramic bowl 150ml -China	VN	EA	20
68	器具	Ceramics bowls 100cc - China	VN	EA	20
135	機器 (比色計)	Chromatometer Model: Thermo Electron Corporation (Spectronic) Model: Genesys 20 S/N: 3SGM139006	VN	EA	1
111	器具	clamp buret - VN	VN	EA	20
104	器具	clamp buret [clamp càng cua]	VN	EA	50
112	器具	clamp Furnaces (loại tốt) - VN	VN	EA	5
109	器具	clamp spheres (loại tốt) - VN	VN	EA	30
106	器具	clamp spheres [loại tốt]	VN	EA	50
108	器具	clamp vitro inox -VN	VN	EA	50
88	不明	Co có 24/29 - Germany	VN	EA	10
136	機器 (PC)	Computer BM Điện [MTV - Mainboard: Gigabyte GA G41MT -ES2L / - Processor Intel: Duo Core E6500 / - Memo	China	set	1
176	機器 (密度計)	density-meter 100ml-China	VN	EA	20
177	機器 (密度計)	density-meter 50ml-China	VN	EA	20
49	器具	Desiccator Φ240- China	VN	EA	4
224	機器	Device defined flashing point open cub - ASTM D92 -KOEHLER - Model: K13990 [Flash & Fire points by Cleveland	VN	EA	1
98	不明	Dignity of fine iron - VN	VN	EA	50
95	器具	distillate oil glass 24/24 - Germany	VN	EA	3
110	器具	Double lock (loại tốt) - VN	VN	EA	30
107	器具	Double lock [loại tốt]	VN	EA	50
96	器具	drilled rubber stopper set - China	VN	EA	1
152	器具	Dropper - VN	VN	EA	80
10	機器	Electrical conductivity meter TRANS INSTRUMENT Model: Walklab Conductivity Pro Meter	Sin	EA	1

181	機器	Electrical conductivity meter TRANS INSTRUMENT Model: Walklab Conductivity Pro Meter	Sin	EA	1
38	機器	Electrical stove - Taiwan	VN	EA	50
220	機器(ガムテスター)	Equipment to determine the amount of plastic - ASTM D381 - KOEHLER - Model: K33800 [Existen Gum Test Apparatus in Fuels]	VN	EA	1
52	器具(三角フラスコ)	Erlen 1 lit nhánh - China	VN	EA	10
144	器具(三角フラスコ)	Erlen 100ml-China	VN	EA	50
101	器具(三角フラスコ)	Erlen 250	Germany	EA	50
50	器具(三角フラスコ)	Erlen 250ml - China	VN	EA	100
51	器具(三角フラスコ)	Erlen 250ml nhám 24/29 - China	VN	EA	100
145	器具(三角フラスコ)	Erlen 250ml-China	VN	EA	50
151	器具(三角フラスコ)	Erlen 500ml -China	VN	EA	5
53	器具(三角フラスコ)	Erlen 500ml nhánh - China	VN	EA	10
258	機器(伝熱コイル)	Experiment for heat transfer coils	VN	EA	1
262	機器(テーブルフレームフィルター)	Experiment lọc khung bằng	VN	EA	1
263	機器(実験流体回路)	Experiment mạch lưu chất	VN	EA	1
257	実験装置(伝熱管の実験)	Experiment of tube heat transfer	VN	EA	1
255	機器(ファン)	Experiment quạt	VN	EA	1
16	器具	Experiment table between the rows of desks with shelves above for chemical 3000x1500x850/1850	VN	EA	1
188	器具	Experiment table between the rows of desks with shelves above for chemical 3000x1500x850/1850	VN	EA	1
198	器具	Experiment table between the rows of desks with shelves above for chemical 3000x1500x850/1850	VN	EA	1
236	器具	Experiment table between the rows of desks with shelves above for chemical 3000x1500x850/1850	VN	EA	1
245	器具	Experiment table between the rows of desks with shelves above for chemical 3000x1500x850/1850	VN	EA	1
273	器具	Experiment table between the rows of desks with shelves above for chemical 3000x1500x850/1850	VN	EA	1
281	器具	Experiment table between the rows of desks with shelves above for chemical 3000x1500x850/1850	VN	EA	1
290	器具	Experiment table between the rows of desks with shelves above for chemical 3000x1500x850/1850	VN	EA	1
301	器具	Experiment table between the rows of desks with shelves above for chemical 3000x1500x850/1850	VN	EA	1
6	器具	Experiment table between the rows of desks with shelves above for chemical 4500x1500x850/1850	VN	EA	1
209	器具	Experiment table between the rows of desks with shelves above for chemical 4500x1500x850/1850	VN	EA	1
178	器具	Filtering paper China	VN	EA	100
46	器具	Flask 1000ml-China	VN	EA	20
44	器具	Flask 100ml-China	VN	EA	50
45	器具	Flask 250ml-China	VN	EA	50
47	器具	Flask 500ml-China	VN	EA	20
48	器具	Flask 50ml-China	VN	EA	20
9	器具	Fume hoods + Donnie	VN	EA	1
23	器具	Fume hoods + Donnie	VN	EA	1
161	器具	funnel extraction100ml (khóa nhựa ké vach) - Germany	VN	EA	10
162	器具	funnel extraction250ml (khóa nhựa ké vach) - Germany	VN	EA	10
163	器具	funnel extraction500ml (khóa nhựa ké vach) - Germany	VN	EA	10
114	機器(炉)	Fumaces 1200 độ C	VN	EA	1
201	機器(炉)	Fumaces Model: Thermolyne Model: F48010 / S/N: 1285090834537	VN	EA	1
20	機器(炉)	Fumaces Model: Thermolyne Model: F48010 / S/N: 1285090834540	VN	EA	1
21	機器(炉)	Fumaces Model: Thermolyne Model: F48010 / S/N: 1285090834573	VN	EA	1
148	器具	Glass centrifuge tubes 10ml-China	VN	EA	50
75	器具	Glass clock cover f125-Germany	VN	EA	96
160	器具	Glass funnel f12-China	VN	EA	30
159	器具	Glass funnel f8-China	VN	EA	50
71	器具	Glass rods-VN	VN	EA	198
179	器具	Gold band filter paper-China	VN	EA	50
180	器具	Green band filter paper-China	VN	EA	50
134	機器(ドライヤー)	Hairdryer-China	VN	EA	5
256	実験装置	Heat transfer in pipe bunch experiment	VN	EA	1
174	器具	High File Cabinet 1700x400x1800	VN	EA	2
97	器具	hopper support ring 100-250-500ml-VN	VN	EA	150
7	器具	Korean magnetic table with lines	VN	EA	1
17	器具	Korean magnetic table with lines	VN	EA	1
189	器具	Korean magnetic table with lines	VN	EA	1
199	器具	Korean magnetic table with lines	VN	EA	1
210	器具	Korean magnetic table with lines	VN	EA	1
237	器具	Korean magnetic table with lines	VN	EA	1
246	器具	Korean magnetic table with lines	VN	EA	1
252	器具	Korean magnetic table with lines	VN	EA	1
261	器具	Korean magnetic table with lines	VN	EA	1
274	器具	Korean magnetic table with lines	VN	EA	1
282	器具	Korean magnetic table with lines	VN	EA	1
291	器具	Korean magnetic table with lines	VN	EA	1
302	器具	Korean magnetic table with lines	VN	EA	1
57	器具	magnetic lock type 40mm - Germany	VN	EA	3
56	器具	magnetic lock type 30mm - Germany	VN	EA	30
58	器具	magnetic lock type 50mm - Germany	VN	EA	3
126	機器(マグネティックスターラー, 攪拌機)	Magnetic stirrer heater box Model: Thermo Model: SP131320-33Q S/N: 1768080501927	VN	EA	1

127	機器(マグネティックスターラー, 攪拌機)	Magnetic stirrer heater box Model: Thermo Model: SP131320-33Q S/N: 1768090689827	VN	EA	1
128	機器(マグネティックスターラー, 攪拌機)	Magnetic stirrer heater box Model: Thermo Model: SP131320-33Q S/N: 1768090793886	VN	EA	1
129	機器(マグネティックスターラー, 攪拌機)	Magnetic stirrer heater box Model: Thermo Model: SP131320-33Q S/N: 1768090793889	VN	EA	1
130	機器(マグネティックスターラー, 攪拌機)	Magnetic stirrer heater box Model: Thermo Model: SP131320-33Q S/N: 1768090793891	VN	EA	1
139	器具(メスシリンダー)	Measurement tube 100ml - China	VN	EA	6
149	器具(メスシリンダー)	Measurement tube 100ml -China	VN	EA	44
146	器具(メスシリンダー)	Measurement tube 250ml -China	VN	EA	50
141	器具(メスシリンダー)	Measurement tube 500ml - China	VN	EA	3
150	器具(メスシリンダー)	Measurement tube 500ml -China	VN	EA	20
140	器具(メスシリンダー)	Measurement tube 50ml - China	VN	EA	6
27	器具	Meeting table 2400x1200x750	VN	EA	1
173	器具	Micropipet -Germany	VN	EA	3
64	器具(乳鉢)	mortar and pestle set $\phi$ 10 -China	VN	EA	3
65	器具(乳鉢)	mortar and pestle set $\phi$ 130 - China	VN	EA	3
63	器具(乳鉢)	mortar and pestle set $\phi$ 90 -China	VN	EA	5
305	機器(オープン)	MULTI PURPOSE OVEN *Model : SHELLAB Model : CE3F-2 S/N: 06035109	VN	EA	1
204	機器(オープン)	MULTI PURPOSE OVEN *Model : SHELLAB Model : CE3F-2 S/N: 06035409	VN	EA	1
193	機器(オープン)	MULTI PURPOSE OVEN *Model : SHELLAB Model : CE3F-2 S/N: 06049309	VN	EA	1
67	器具	niken cub 50cc - China	VN	EA	20
54	器具	per beam 250ml - Anh	VN	EA	30
183	器具	per beam 500 ml	Anh	EA	50
166	器具	Pipet k $\acute{e}$ 1ml -Germany	VN	EA	50
102	器具	Plastic lock Buret 0.1x25 ml	Germany	EA	50
86	器具	Plastic water bottles 10L-VN	VN	EA	10
87	器具	Plastic water bottles 25L-VN	VN	EA	10
59	器具	Plastic weight Model : Nhân Hòa	VN	EA	1
60	器具	Plastic weight Model : Nhân Hòa	VN	EA	1
61	器具	Plastic weight Model : Nhân Hòa	VN	EA	1
76	器具	Plastic wire fitted distilled	VN	EA	50
221	機器(計測機器)	Pressure measuring device - ASTM 323 - KOEHLER - Model: K11459 / [Vapour Pressure of Petroleum Products]	VN	EA	1
122	機器(プリンタ)	Printer Canon 2900 [Yên]	VN	EA	1
253	実験装置	Pump Experiment	VN	EA	1
123	器具(攪拌機)	PUTTING stirrer Model: IKA Model: RW 16 basic S/N: 07176420	VN	EA	1
124	器具(攪拌機)	PUTTING stirrer Model: IKA Model: RW 16 basic S/N: 07176422	VN	EA	1
125	器具(攪拌機)	PUTTING stirrer Model: IKA Model: RW 16 basic S/N: 07176423	VN	EA	1
24	機器(冷蔵庫)	Refrigerator FUNYKY 152Lit	VN	EA	1
216	機器(冷蔵庫)	Refrigerator FUNYKY 152Lit	VN	EA	1
131	機器(ラウンドシェーカー, ミニシェーカー)	ROUND SHAKERS Model: IKA Model: KS260 S/N: 07176373	VN	EA	1
132	機器(ラウンドシェーカー, ミニシェーカー)	ROUND SHAKERS Model: IKA Model: KS260 S/N: 07176374	VN	EA	1
105	器具	Shelves for chemical - Inox304 / Sơn Epoxy chống hóa chất / KT (D $^{\circ}$ R $^{\circ}$ C):1200*450*1800 mm	VN	EA	2
153	器具	Solder ball birth canal 24/29 - Germany	VN	EA	15
156	器具	Solder ball birth canal 24/29-Germany	VN	EA	10
41	器具	spheres 2 cổ đáy bằng 24/29 250ml - Germany	VN	EA	10
42	器具	spheres 2 cổ đáy bằng 24/29 500ml - Germany	VN	EA	10
39	器具	spheres 250 cổ 24/29 - Anh, Germany	VN	EA	15
43	器具	spheres 500 cổ 24/29 - Anh, Germany	VN	EA	10
164	器具	Spherical pipet10ml-Germany	VN	EA	50
165	器具	Spherical pipet5ml-Germany	VN	EA	50
155	器具	Spiral welded tube 24/29 - Germany	VN	EA	15
158	器具	Spiral welded tube 24/29 -Germany	VN	EA	10
113	器具	Square plastic basket for instruments - VN	VN	EA	100
25	器具	stainless steel pot-VN	VN	EA	20
99	器具	Stainless steel test tube racks f20-VN	VN	EA	29
100	器具	Stainless steel test tube racks f24-VN	VN	EA	20
254	実験装置	Stiring Experiment	VN	EA	1
157	器具	Straight pipe weldin 24/29-Germany	VN	EA	10
154	器具	Straight pipe welding 24/29 - Germany	VN	EA	15
182	器具	Straightl pipet 10 ml	Germany	EA	40
167	器具	Straightl pipet 10ml - China, Germany	VN	EA	30
172	器具	Straightl pipet 20ml - China, Germany	VN	EA	29
168	器具	Straightl pipet 25ml - China, Germany	VN	EA	30
169	器具	Straightl pipet 2ml - China, Germany	VN	EA	30
170	器具	Straightl pipet 50ml - China, Germany	VN	EA	30
171	器具	Straightl pipet 5ml - China, Germany	VN	EA	30
3	器具	Table round the wall 7800x750x850 (no sink)	VN	EA	1
28	器具	Table round the wall (Kho pha HC)7800x750x850(with sink)	VN	EA	1
185	器具	Table round the wall 10500x750x850(no sink)	VN	EA	1
196	器具	Table round the wall 10500x750x850(no sink)	VN	EA	1
234	器具	Table round the wall 10500x750x850(no sink)	VN	EA	1
242	器具	Table round the wall 10500x750x850(no sink)	VN	EA	1

270	器具	Table round the wall 10500x750x850(no sink)	VN	EA	1
278	器具	Table round the wall 10500x750x850(no sink)	VN	EA	1
297	器具	Table round the wall 10500x750x850(no sink)	VN	EA	1
243	器具	Table round the wall 1900x750x850(no sink)	VN	EA	1
13	器具	Table round the wall 3900x750x850(no sink)	VN	EA	1
265	器具	Table round the wall 3900x750x850(no sink)	VN	EA	1
14	器具	Table round the wall 4400x750x850(no sink)	VN	EA	1
298	器具	Table round the wall 5520x750x850(no sink)	VN	EA	1
186	器具	Table round the wall 5520x750x850(no sink)	VN	EA	1
271	器具	Table round the wall 5520x750x850(no sink)	VN	EA	1
299	器具	Table round the wall 5800x750x850(no sink)	VN	EA	1
235	器具	Table round the wall 5800x750x850(no sink)	VN	EA	1
241	器具	Table round the wall 5800x750x850(no sink)	VN	EA	2
287	器具	Table round the wall 6300x750x850(no sink)	VN	EA	1
244	器具	Table round the wall 6600x750x850(no sink)	VN	EA	1
279	器具	Table round the wall 7360x750x850(no sink)	VN	EA	1
288	器具	Table round the wall 7360x750x850(no sink)	VN	EA	1
29	器具	Table round the wall 7800x750x850(no sink)	VN	EA	1
207	器具	Table round the wall 8000x750x850(no sink)	VN	EA	1
187	器具	Table round the wall 9000x750x850(with sink)	VN	EA	1
197	器具	Table round the wall 9000x750x850(with sink)	VN	EA	1
4	器具	Table round the wall 9100x750x850(with sink)	VN	EA	1
266	器具	Table round the wall 9200x750x850(with sink)	VN	EA	1
267	器具	Table round the wall 9200x750x850(with sink)	VN	EA	1
272	器具	Table round the wall 9200x750x850(with sink)	VN	EA	1
280	器具	Table round the wall 9200x750x850(with sink)	VN	EA	1
289	器具	Table round the wall 9200x750x850(with sink)	VN	EA	1
300	器具	Table round the wall 9200x750x850(with sink)	VN	EA	1
5	器具	Table round the wall 9300x750x850(no sink)	VN	EA	1
15	器具	Table round the wall 9300x750x850(no sink)	VN	EA	1
208	器具	Table round the wall 9500x750x850(no sink)	VN	EA	1
2	器具	Table with sink 1500x750x850	VN	EA	2
12	器具	Table with sink 1500x750x850	VN	EA	2
184	器具	Table with sink 1500x750x850	VN	EA	2
195	器具	Table with sink 1500x750x850	VN	EA	2
206	器具	Table with sink 1500x750x850	VN	EA	2
233	器具	Table with sink 1500x750x850	VN	EA	2
240	器具	Table with sink 1500x750x850	VN	EA	2
251	器具	Table with sink 1500x750x850	VN	EA	1
260	器具	Table with sink 1500x750x850	VN	EA	1
269	器具	Table with sink 1500x750x850	VN	EA	2
277	器具	Table with sink 1500x750x850	VN	EA	2
286	器具	Table with sink 1500x750x850	VN	EA	2
296	器具	Table with sink 1500x750x850	VN	EA	2
1	器具	Teacher table 1150x600x750 (with 2 chamber suspended box)	VN	EA	1
11	器具	Teacher table 1150x600x750 (with 2 chamber suspended box)	VN	EA	1
26	器具	Teacher table 1150x600x750 (with 2 chamber suspended box)	VN	EA	1
194	器具	Teacher table 1150x600x750 (with 2 chamber suspended box)	VN	EA	1
205	器具	Teacher table 1150x600x750 (with 2 chamber suspended box)	VN	EA	1
232	器具	Teacher table 1150x600x750 (with 2 chamber suspended box)	VN	EA	1
239	器具	Teacher table 1150x600x750 (with 2 chamber suspended box)	VN	EA	1
250	器具	Teacher table 1150x600x750 (with 2 chamber suspended box)	VN	EA	1
259	器具	Teacher table 1150x600x750 (with 2 chamber suspended box)	VN	EA	1
264	器具	Teacher table 1150x600x750 (with 2 chamber suspended box)	VN	EA	1
268	器具	Teacher table 1150x600x750 (with 2 chamber suspended box)	VN	EA	1
276	器具	Teacher table 1150x600x750 (with 2 chamber suspended box)	VN	EA	1
285	器具	Teacher table 1150x600x750 (with 2 chamber suspended box)	VN	EA	1
295	器具	Teacher table 1150x600x750 (with 2 chamber suspended box)	VN	EA	1
8	機器(計量器)	Technical weight Model: Sartorius Model: TE412 S/N: 23805111	VN	EA	1
18	機器(計量器)	Technical weight Model: Sartorius Model: TE412 S/N: 23805478	VN	EA	1
191	機器(計量器)	Technical weight Model: Sartorius Model: TE412 S/N: 23807016	VN	EA	1
293	機器(計量器)	Technical weight Model: Sartorius Model: TE412 S/N: 23807701	VN	EA	1
303	機器(計量器)	Technical weight Model: Sartorius Model: TE412 S/N: 23807706	VN	EA	1
223	機器	Test equipment for coagulation - ASTM D2386 - KOEHCLR / Model: K29795 [Freeze Point Apparatus]	VN	EA	1
89	器具	The rubber stopper No. 10-VN	VN	EA	10
90	器具	The rubber stopper No. 11-VN	VN	EA	10
91	器具	The rubber stopper No. 12-VN	VN	EA	10
92	器具	The rubber stopper No. 13-VN	VN	EA	10
93	器具	The rubber stopper No. 14-VN	VN	EA	10
77	器具	The rubber stopper No. 1-VN	VN	EA	25

78	器具	The rubber stopper No. 2-VN	VN	EA	25
79	器具	The rubber stopper No. 3-VN	VN	EA	25
81	器具	The rubber stopper No. 4-VN	VN	EA	20
82	器具	The rubber stopper No. 5-VN	VN	EA	20
83	器具	The rubber stopper No. 6-VN	VN	EA	20
84	器具	The rubber stopper No. 7-VN	VN	EA	20
85	器具	The rubber stopper No. 8-VN	VN	EA	20
94	器具	The rubber stopper No. 9-VN	VN	EA	10
249	実験装置	thermodynamics Experiment	VN	EA	1
137	器具(温度計)	Thermometer Hg 100-China	VN	EA	50
138	器具(温度計)	Thermometer Hg 300-China	VN	EA	50
225	器具(Smoke point lamp)	Thiết bị xác định điểm khói của dầu- ASTM D1322 - KOEHLER - Model: K27000 [Determination of Smoke Point]	VN	EA	1
74	器具	Tube cleaning brushes -VN	VN	EA	100
190	機器(吸引ポンプ)	VACUUM PUMPS Model: KNF - Germany Model: N026.3 AN18 S/N: 03526454	VN	EA	1
200	機器(吸引ポンプ)	VACUUM PUMPS Model: KNF - Germany Model: N026.3 AN18 S/N: 03526458	VN	EA	1
283	機器(吸引ポンプ)	VACUUM PUMPS Model: KNF - Germany Model: N026.3 AN18 S/N: 03526459	VN	EA	1
292	機器(吸引ポンプ)	VACUUM PUMPS Model: KNF - Germany Model: N026.3 AN18 S/N: 03526464	VN	EA	1
117	器具(ビスコメータ)	viscometer Cannon φ100	VN	EA	2
118	器具(ビスコメータ)	viscometer Cannon φ150	VN	EA	2
119	器具(ビスコメータ)	viscometer Cannon φ200	VN	EA	2
142	器具(ビトロ)	vitro f18-Germany	VN	EA	200
103	器具(ビトロ)	vitro Ø18	Germany	EA	200
143	器具(ビトロ)	vitro Pyrex d=24 - Anh	VN	EA	70
215	機器(安定化電源)	voltage stabilizer LIOA 15KVA/3Phase [Modem: NL-15000W / SH3-15K]	VN	EA	1
115	機器	Water filter one TIME Model: AE-10 MO Model: Tyumen Mediko	VN	EA	1
116	機器	Water filter one Model: AE-10 MO Model: Tyumen Mediko	VN	EA	1

(Source: HUI-TH)

The training facility like are effective in the understanding of the process equipment and refineries. In contrast, the table 3-25 is listing the teaching facilities at Akita Technical Upper College.

**Table 3-25: Examples of devices in physics teaching techniques Akita Technical College**

<ul style="list-style-type: none"> <li>. Super Speed Centrifuge</li> <li>· Analysis dynamometer, Spectrometer</li> <li>· continuous multi-stage distillation equipment</li> <li>· Gas chromatography</li> <li>· Equipment · Differential thermal analysis equipment</li> </ul>	<ul style="list-style-type: none"> <li>· X-ray diffraction analysis of high-performance</li> <li>· Measurement of nuclear magnetic resonance spectrum</li> <li>· High-performance liquid</li> <li>· Equipment used mass spectrometry analysis with gas chromatography</li> <li>· Ion chromatography</li> </ul>
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(Source: Akita Technical Upper College, 2007, 2011)

These devices are not only effective on the understanding of the process equipment or oil refineries, but also effective in understanding the principles. As described, HUI-TH can only do the distillation

experiments, while Akita Technical Upper College, apart from distillation experiments, can also perform analysis of the isolate material. This means that it is able to assess the results obtained from the distillation process and then compare them with theory or principles learned from the lectures. The study cycles has experimental character (theoretical, experimental, confirmed the phenomenon and evaluation) like this when the school principle or theory can provide highly effective in understanding nature, and can learn the ability to solve problems based on theory. Thus, educational equipment of petrochemical field of Faculty of technology of HUI-TH is focused on learning the practical application skills, and educational equipment of Akita Technical Upper College is a device focus on learning theory, learning systematic knowledge.

It can be concluded that the educational equipment of the establishment HUI-TH only be effective in practical learning tasks, operation of oil filtering equipment, petrochemicals. University of Petro Vietnam also has a similar training facility, and after being recruited into the company, students will receive practical training with the same device. Also, if you do not get the machine operating model will not actually make sense.

At the school, not learning how to manipulate the device, but careful study engineering principles and processes are expected. We can see the need to have teaching facilities that are capable of learning theory which is the framework of professional fields.

### **3.3 Results, Situation of training and assurance of personnel for the Dung Quat oil refinery**

Dung Quat oil refinery is the first refinery in Vietnam. Therefore, the plant is forced to start operating in condition of absolutely no experienced personnel which is assumed to encounter many difficulties. At that time, the plant had done the work of education and training previously should be fully solved this problem. In addition, the plant is also based on this experience to expand education and training system. At the same time, we also conducted hear information concerning the situation of heavy industry (cement industry) in Thanh Hoa Province.

#### **3.3.1 Training personnel for the operation of Dung Quat Oil Refinery**

Dung Quat oil refinery was completed in February 2009, to May 2009 it officially went into operation. The contractor Technip (EPC Contractors of the Oil Refinery) handed over the project to Petro-Vietnam. After the hand over, Technip is responsible for maintenance for 2 years. In addition, SK Korean contractor won the O & M contract. It has arranged around 100 employees for a period of 5 years, step by step transfer of technology for technicians employed in Vietnam. When conducting an oil refinery production in Dung Quat oil refinery, PV also delayed in refining and has lost about 3 years to train English as well as technical training. The result is that after a long period of preparation, they have improved their English, and prepare and fulfill in terms of knowledge and practical experience in the field



of oil refined through the dispatch personnel to the other refineries to train.

### 3.3.2 Ensure personnel at Dung Quat Economic Zone (Special Economic Zone of Quang Ngai)

#### 3.3.2.1 Recruitment situation in Dung Quat Economic Zone

Dung Quat Special Economic Zone was established in 2005 and started at the same time with the development project. SEZs have 10,500ha wide area (total investment of \$ 8 billion) with the downstream industry (2,100ha) in the west area of, the Heavy Industry is the east area, the industrial port, commercial port (300ha and 5,054ha), and oil refinery plant (151ha) with a total investment of \$ 3 billion.

In the areas, there are with Petro-Vietnam, Heavy Industry Dosan (118 ha with a total investment of 200 million USD), Petro-Vietnam Ethanol plant (\$ 600 million capital investment, former Vinashin Shipbuilding). There are currently 111 projects are planned or are underway with total budgets exceeding \$ 4.8 million, respectively, with 60% of the total estimated investment capital.

In addition, there are 67 projects on commercial production began with the total number of personnel working in the economic zone is 13,500 people. The size of the turnover of Dung Quat economic zone is up to 70% of the total domestic product of Quang Ngai Province. As a result, the Government has started implementing the second plan which is to allow expansion 45,000ha, focusing on three areas of Heavy and petrochemical Industries, steel processing plant and electricity.

The demand for new recruits is 5,000 more personnel (by 2020), requires more skilled personnel. Currently, in the Special Economic Zones, in total 13,500 personnel employed, there are 24% university, upper college graduates, 42% skilled personnel; 34% ordinary labor. Overall, the economic zone is expected to 20,000 personnel have by 2015 and 50,000 employees by 2020, 80% of which expected to have been trained.

Dung Quat Vocational School was established to meet this demand. The school was established in 2001, being a training establishment specialized in the oil refinery and Mechanical industry. Regarding the equipment and facilities, the technical standards of the State are applied, most faculty have master's degrees. Dung Quat oil refinery is the first facility of that kind in Vietnam so it attracts students nationwide.

Regarding the recruitment of the Dung Quat oil refinery, the plant has 1,400 people, 1,000 personnel directly related to the operation of equipment and 210 personnel working in the business unit and departments indirect the operation, 147 foreign experts to support the operation, number of employees graduated from the University and Upper Colleges are 889 people (63.5%). Number of workers is 497 persons, of which most are recruited from Dung Quat Vocational School (35.5%).

The encouraging level for those who work in the economic zone is 150% (continuous from 2011 to 2016). In addition, the incentive for state employees is 170% for civil servants southern coastal area of Dung

Quat special economic zones, other areas of 150%.

### **3.3.2.2 Recruitment situation and operating situation in the oil refinery of Petro-Vietnam (Dung Quat)**

Total number of personnel of the Dung Quat oil refinery is 1357 people. Of these, 26 are doctoral, masters, mainly came from Hanoi, Da Nang, University of Industry in Ho Chi Minh, France (Lyon, Paris), Thailand (ICT). Specifically, the number of university graduates is 689 people, the number of professional upper college graduates is 131 people, a vocational upper college graduates is 112 people, professional /vocational Lower College is 391 person, ordinary hygiene employees is 7 people.

Initially, the Dung Quat oil refinery is a joint venture with Russian company Rosneft, but by 2002 had removed the joint venture. Currently Petro-Vietnam holds 100% stake. In terms of recruitment, the factory has started recruitment in 1998, and by 2008 more than 1200 personnel hired and start working.

Regarding the training for staff, 930 personnel were trained in basic knowledge in the Petro-Vietnam training center in Vung Tau (PVMTC), 26 personnel were trained in analytical technical centers of PVN, 37 personnel are trained in traffic engineering in the harbor and shipping at the University of Oceanography.

Thus a total of 993 personnel were trained in the country. On the other hand, in preparation for going into operation, the plant also conducts training for workers at the petrochemical plants overseas. Plant personnel was sent for training at the oil refinery in Indonesia (Pertamia), USA (UOP), the maintenance personnel training have sent in Romania (Petro Consultee), the operator has sent personnel to Russia (Yaroslavl Oil Refinery), Malaysia (Petronas Melaka Oil Refinery).

Additionally, the plant sent personnel to practice in many oil refineries of Technip abroad. In that most are in Korea (Konan Oil Company) who has received a total of 216 students. Also, in the construction phase, approximately 2,348 personnel have been trained with 181 training courses at EPC (JGC in Yokohama), France (Technip), Spain (TRI Company)... Once in operation, SK Korean contractors (operators) have received training technology transfer. In addition, the consulting firm KBC (UK) is sending 7 teachers to training.

In the Dung Quat oil refinery, it is now able to make transfers from foreign experts to Vietnam people for stable operation. However, the ability to maintain and operate at standard operating value (optimization capabilities) and experience, there are still a lot of limitations. To support the operation, a maximum of 177 personnel from Korea, India and the U.S. support operation and maintenance.

Currently this number has reduced by half (90 people, plus 57 maintenance personnel). Moreover, this support is expected to end in 2013. In terms of training for staff, the educational system of Vietnam in the field of operation of the refinery is incomplete so if one just graduated from college or university education, he/she can not work immediately yet. Additionally, in the Universities and Upper Colleges, the

theoretical education and vocational training were mixed up. So after recruitment there is a need for re-education and re-training. Dung Quat oil refinery has increased the recruitment of local staff, for example, more than half the managers at the plant are from Quang Ngai. The staff is highly conscious and can move to Nghi Son plant. In terms of personnel, with 1,000 people the mechanisms in oil production are 500 operational personnel in oil production department, 300 personnel for maintenance and 200 personnel to do other work. On the mechanism of operation of the Refinery, there are all 14 individual equipments, divided by 7 devices in 7 major process CCR, Hospitality & (UOP), CDU (KEPP), RFCC, hydrogen treating, Amine recovery and Caustic to operate. Auxiliary equipment has 10 devices, including nitrogen, WWT ... In addition, Propylene plant with a capacity of 50,000 tons / year and the equipment Department to enter the wharf of loading/unloading warehouses for refined oil department separately. Therefore, the whole plant has nine operational management personnel for each area (equipment). Bio-ethanol Equipment and Tank form are attached to another company. The operational team is divided into four teams with 3 shifts; the total number of personnel in the operation panel is 120 people. For example, the organization is shown as follows: a team with 7 people and is arranged under the supervision of the Department Head. In other words, from regional manager level  $\Rightarrow$  general foreman (Department Head)  $\Rightarrow$  4 teams from team A to team D, a total of 28 personnel directly related to the device. The work of the employees directly related to the operation can be classified as follows: Head of shift, senior operators, operation panel operators, high-end operating personnel in each area, personnel operating in each sector (4 people). Additionally, if horizontally cut in each area, between Area manager and the General supervisors (Department heads) will be operation supervisor and controllers for every day supervision and control tasks between the areas of devices. Relationship with Vocational School is the communication back and forth through the analysis of the training school. Here also there is an intent on sending teachers but is not currently feasible. At the time of initial construction, the plant has recruited a large amount of personnel.

Currently, due to the amount of personnel for plant has been fixed, the plant is not to conduct recruitment from vocational training school any more. The promotion to technician level depends on the employee's qualifications. However, under the current regime, if they just graduated from upper college, they can make up to Foreman only. It is expected that this will be more open. The factory encourages learning to get more certificates (carry-up); most cases are self-studied to strive to get the certificate. The company also supports financially but with a very small amount, so no personnel to use this mode. However, the PVN University began to admit students with the purpose of research and development and personnel training of staff therefore later Dung Quat oil refinery personnel can also study here. For additional personnel to compensate the ones left, they will first attempt to resolve with existing capabilities and employing more personell when beyond. As the number of job applicants a lot, until the present time there is no any problems. For Technical Manager applies only internal training rather than employment. This is a separate topic, but there are often stories that RFCC shut down but not related to levels of less skilful operation.

Causes of Shut-downs of the RFCC are currently investigated by the licensors and the contractor (JGC). It's just speculation, but perhaps the problem is caused by the mobility of the catalyst. Such Shut-down is not due to interlock but that most of the evaluation of the operator. This phenomenon is not a phenomenon arising after commissioning that right from the initial stage this problem had arises.

### **3.3.3 Status of Education and Training at the Dung Quat Vocational Upper College of Techniques and Technology - Quang Ngai Province**

For the purpose of training personnel for recruitment into the enterprises invested in Dung Quat Economic Zone, Dung Quat Vocational College of Technic and Technology was opened in 2001 in the province Quang Ngai. Currently 1.200 students are participating in training at the School in the faculties such as Faculty of Mechanical, Faculty of Ship Bulding, Faculty of Petro-chemical etc...

Until late 2011, the University has trained 12,000 students, of which more than half of students (6,500) working in Dung Quat economic zone, in which mainly focus on the Dung Quat oil refinery (500 people), Dosan Heavy Industry Factory (1,000), Shipyard of Petrovietnam (1,800 people) and so on.

Danish Agency for International Cooperation and Development (DANIDA) has assistance programs for the Dung Quat Vocational Training School from 2003 to 2011 in Quang Ngai Province. The content is provided to support teaching materials and technical support.

About Technical support, is was authorized to three organizations includes 2 Vocational Training Units of Denmark which is Danish Vocational Training Center "Selandia College" and EUC-Syd, and Training Unit of the Norwegian Competence Center in Rogaland Norway (RKK). The contents include: Guidelines on Training Method for Welding, Mechanical, Maintenance, Petrochemical Analysis for University teaching staff, Upgrading the Technical Education and Training of Trainers, guide training Teacher, Give guidance to training trainers to be trained in Denmark, Norway.

Selandia College is the largest Training Unit in private sector in Denmark. It has 460 employees (of which 250 teachers), annually they provide vocational training for 10,000 students. EUC-Syd is also a private vocational training unit in Denmark, with 530 employeex. It is providing training for 3,000 students. RKK is the Training Unit established in Rogaland - Norway, in which there are 30 training institutions.

On the support of private enterprise for Schools, Korean Shipbuilding Company called Doosan Vina (factory built in Dung Quat Economic Zone, which has 2,000 employees working at this plant) has provided Welding rodes used for training. In addition, it conducted from 2009 training program and training cooperation. In April 2011 there were 37 graduates, then in September 2011 had received 30 people to work in the Company. After hiring, these employees are engaged in additional training for 7 weeks in Doosan Vina's shipyard, and then assigned to the Department/unit to work.

With the same manner, when buit Dung Quat oil refinery, Technip- JGC JV helped Training for Welding

Students and recruited them into construction.

### **3.4 Overview of Training Staff of the Petro-Vietnam (PVN)**

#### **3.4.1 The Oil and Gas Vocational Upper College (Petro Vietnam Manpower Training College - PVMTC)**

PVMTC is the school to provide training before and after employment in manual labor sector (without qualification) of the PVN, established in 1975 as a vocational training school. In 2000, the school has been recognized as the Upper College and has expanded its content on business management training for technical labor (engineers) in parallel with the training for manual labor. Currently, the university has received the HR practitioner of the other companies than Petrovietnam and to date has trained 10,781 students.

The training programs of the School are as follows:

1. Petroleum production and exploration
2. Oil and gas transportation, storage and distribution
3. Oil and gas processing
4. Utility equipment operation
5. Petroleum mechanical equipment
6. Industrial Electricity - Automation and Instrumentation
7. Welding - assembling - corrosion - non destructive testing
8. Diving underwater & topside inspection
9. Safety - Health – Environment
10. Specific training for pre-employees
11. Management, financing, training and law training Programmes

The school has conducted education and training for those working in the oil refinery, fertilizer plant, and oil drilling at sea with rich teaching materials, as typical device simulation to training for each device in the factory. With the use of these training materials, the school is also responsible for the inspection and repair of machinery and equipment.

#### **3.4.2 Petro Vietnam University**

PVN established the Vietnam Oil and Gas University aiming to improve the capacity of employees in companies and research development support. The first batch in 2011 included 150 learners. Now, as the school under construction students are attending courses in Vinh Yen in southern Vietnam. Following is

the general description.

Name: Petro-Vietnam University – PVU

Under: PVN, MOET, MOLISA

Location: Vinh Yen (temporary facility near Vung Tau in southern Vietnam), the main facility under construction in Vinh Phuc Province (50 km from Hanoi, completed in 2013)

Training Fields: Mining Engineering, oil and gas exploration, oil refinery - petrochemical, Economics, Management, And Environment

Stage 1: Expected to have IT industry, Energy, Automation

Stage 2: (when completed)

    Fundamental science

    Geo-science

    Petroleum Engineering

    Petrochemicals & Refinery

    Storage and Transportaion

    Petroleum Management and Economics

    Petroleum safety and environment

    Design and construction of petroleum facilities

    Mechanics – Automation – Petroleum Equipments

    IT

    Electric – Electronics

    Foreign language center

    Center for advanced training

    Center for R&D and technology transfer

Teaching Language: English

Lecturer:                   Phase 1 (2011-2015): 75% Trainers are Masters

                                  Phase 2 (2016-2025): 95% Trainers are Masters

                                  Phase 3 (2026-2050): 100% Teacher Master up and 90% are PhD

Lecturer PVU: 60%

Lecturer outsourcing: Scientists and experts from Petrovietnam, Lecturer at the Universities in the

country: 20%

Lecturer Vietnamese living abroad, foreign Lecturer: 20%

Student: First Course: Upper College Graduated: 150 students, short-term training students: 200 students

Stage 3: Graduated Upper College: 2,000 students graduated from school: 500 students

Intensive training program: 10,000 to 15,000 students

The goal is to provide training for Petrovietnam and foreign organizations for manpower development and training of high quality research to become the center of the highest quality training in Vietnam by 2020.

School plans to use training programs, curricula, teaching materials of universities domestic and abroad.

The current situation of the University of Petro Vietnam as follows:

In 2011, the university has a total of 69 faculty members (of which 21 lecturers in Ba Ria campus, 28 teachers are attending training courses, eight faculty members are studying abroad with the Maste, Ph.D.) and 146 students in 4 disciplines (Petroleum Geology, Petroleum Geophysics, oil and Gas Drilling and mining, oil refinery - petrochemical).

In 2012 it is expected to recruit 150 students. The school also plans to open training course on Offshore engineering MSc in collaboration with TU Delft (University of Technology Delft - Netherlands).

In 2013, the University will begin training course MBA in Finance and governance in the petroleum business.

Regarding international cooperation, the university has partnered with Schlumberger (engineering company), Honeywell (The company manufactures control devices, equipment for training simulation), Delft University of Technology, University of Tulsa , Colorado school of Mines, Sejong University (Korea), NRF etc.. The school also recruited from the NRF (South Korean consulting firm), University of Delft (Netherlands), and University of Tulsa (U.S.) a person per organization as a teacher.

### **3.4.3 Required certificates and occupation types of Petro Vietnam personnel**

In Petrovietnam Oil Refinery, the personnel for operation of control panel are an engineer (university graduated), operating personnel in each technical field is technician (Upper college graduation), maintenance staff is technician (graduated upper college), and the rate of engineer per technician is 20:80. Technicians are recruited from Upper colleges and vocational Upper colleges, also known as Workers.

Regarding the hiring and training personnel for the new plant, such as Ca Mau Fertilizer Plant, recruitment and training were conducted prior to plant operation 27 months for engineers and 21 months for technical members. Recruitment time is 6 months. Training content includes: English (720 hours as engineers and technicians is 360 hours), specialized English (240 hours), Basic Theory (240 hours), Training and Education by the EPC contractor Hygiene and safety (30 hours), on the job training (OJT) at

Fertilizer Plant has been completed (6 months). There are cases where students feel like training time was too long so they dropout

Construction sites of Petrovietnam Oil Refinery and Fertilizer Plant are often selected far from city centers, the staff is not stable, so should be encouraged as supporting items in remote areas and so on.

Moreover, due to the influence of Confucianism Vietnam people consider the eldest son custom descendants. Therefore, despite the working place is far away it is just temporary and will definitely tend to return to their homeland. So here it should encourage the recruitment of local personnel. As in the Dung Quat oil refinery as well, 55% of staff who work here are in Quang Ngai. 90% of the cost of personnel training is held by PVI. If somebody changes jobs he/she will need to require such costs compensation.

PVN now has not decided to start projects in the future plans of Nghi Son and Long Son, the recruitment and training has not been started. Staff of the Nghi Son refinery has not been specified. However, because there can use the real machinery of Dung Quat oil refinery, oil factory of Idemitsu Kosan or can use the training facility's PVN companies , Nghi Son oil refineries will have better conditions than the Dung Quat oil refinery to start operation. About 100 people came from Nghi Son are working in Dung Quat, but PVN has no plans to move the employees to Nghi Son.

### **3.5 Status of Support of International Aid Organization**

The main International Aid Organizations of the International organizations and Governments are supporting the field of Industrial Upper College Education, Vocational Training of Vietnam are: World Bank (WB), Asian Development Bank (ADB), the Nordic Development Fund (NDF), the French Development agency (Agence Francaise de development: AFD), the Norwegian development Fund (Nordic Development Fund: NRD), Germany (GIZ), Korea (KICA), Japan, Australia etc...

Following ADB, in the field of Technical Education and Vocational Training 6 projects have been implemented, made \$ 156 million of aid. There are currently 12 projects with a total \$ 144 million grant is being implemented.

Inwent: Ccapacity Building International

Lux-Development: Luxembourg Agency for Development Cooperation

EDCF: Economic Cooperation Development Fund

DANIDA: Danish International Development Agency

APEFE: Association pour la Promotion de l'Education ed de la Formation a l'Etranger

Vietnam is a founding member of the Asian Development Bank in 1966. Since 1993, the Asian Development Bank has implemented support for Vietnam in a wide range such as a refundable aid, grant



aid, technical support etc. ..., the first to tell is the Lending of \$US 9 billion. According to the Action Plan in Vietnam that the Asian Development Bank announced in October 2011, in the field of Technical Education and Vocational Training, the following program supports are implemented: Development Project for Upper Secondary Education, Development Project for Hanoi University of Science and Technology. In addition, the projects intend to support following from 2012 onward are Lower Secondary Education for the most difficult areas, the Human Resources for Science and Technology project, Development of Education Sector etc. ...

Related to this survey, from June 2011 it has started to implement support for higher levels of education, curriculum in Technical and Technology education in Industry.

In addition, the Asian Development Bank in partnership with the Ministry of Labour - Invalids and Social Affairs, intends from 2012 began to support Education and Technical Training for 20 Vocational Training School in the areas of: Automotive Engineering, Electrical Manufacturing, Information Technology, Mechanical Manufacturing. Contents of aid include: Provide Equipment, Teacher Training, Schools Business Promote and Provide Training System.

The World Bank is providing support to Vietnam with a focus on: Basic Education, Education of Children with Disabilities, Ethnic Education. In the field of Upper college education as such, is implementing assistance for encourage policies for Upper college education for ethnic minorities and the poor class. Additionally, it was proposed to improve the status of incompatibility between HR needs of industries and the training situation in the Education and Training establishments.

French Development Agency since 1994 has implemented 43 projects in Vietnam, with no binding investment capital of Euro 100 million each year. Vietnam and France have signed a framework document of Partnership in 2006. In the Planning for Socioeconomic Development in 2011-2015 period it is implemented the support with four major categories which are: Development of Regional modern Currency, Promotion of Power Local Delegation, Metropolitan Infrastructure / Public Services, Dynamicization of Local Economy. Vocational training is also supported, from 2004 to 2010 provided Vocational training for 51,645 people.

Organization for International Cooperation of Germany (GIZ) since 1993 has made over 20 projects for Vietnam. Key areas are: Utilization and Sustainable Protection of Environment and Natural Resources, Sustainable Economic Development, Health sector. In the field of Technical Education and Vocational Training currently two following projects are implementing:

Consulting Service on Technical Education and Vocational Training Project of the GIZ had been implemented from 2008 to 2011. The partner was the Ministry of Labour - Invalids and Social Affairs. In this project, GIZ supported in setting up the Strategy for Vocational Training from 2010-2020 for the Ministry of Labour - Invalids and Social Affairs. In 2009, GIZ signed MOU with Vietnam Association of Vocational Training, General Department of Vocational Training of Vietnam, conducted the Support for

Training establishments, Financial Aid, Support the marketing business.

Training Program Project in 2008 is being implemented from 2009 to 2013. This project, in addition to Provide Equipment also includes content such as: Assessing 25 Vocational Training Establishments, Seeting up Development Plan for 5-7 Programs of Technical and Finance Support, Innovation of existing equipment and supplies, Teaching about Vocational training and orientations, guidance on orientation training and vocational training in new industry sectors, Human Resources Training for School Management Training, Internet network equipment provision etc...

Korea International Cooperation Agency (KOICA) is currently focusing on Elementary Education and Vocational Training for Upper Secondary level in the International Support in the field of education. In the field of vocational training it has implemented Professional Technical Training, having training plan for skilled workers and by improving productivity in the industrial sector to promote poverty alleviation, and Economic Development. Specifically, in the countries are conducting: building facilities for Training School and Lower and Upper Colleges, Equipment Providing for Education and Training, exploit and develop curriculum for vocational training, textbooks training; Teacher Training, School management improvement. In Vietnam, during the years 2011-2013 is implementing upgrading Quang Tri Lower college School project

In September 2009, the Australian Government set up a comprehensive Partnership with the Government of Vietnam, according to which it is implementing the aid program from 2010 to 2015. Under this aid program, to convert Vietnam's economy based on exports with low added value into the intergrated economy of high added value, it need to be equipped with good infrastructure, training human resources, improvement of law system. Regarding human resources, the percentage of Lecturer in Education has a Ph.D. in only 12%; according to the Foreign Investment Report there is a severe shortage of graduates with technological industrial background compared with market demand. This situation is very dangerous for Vietnam to focus on manufacturing economy with low labor charges. Therefore, the aid program focuses on three key support areas which are: Human Resource Development, Economic Integration and Environment. For Human Resource Development, by 2015 provide 1,380 Scholarships Study in Australia and 300 PhD Scholarship.



## Chapter 4

### Main findings and recommendations

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## 4 Main findings and recommendations

### 4.1 The main findings

The following describes the detected points of education, professional training of heavy industry and petrochemicals through the whole of Vietnam. These are issues related to the culture of Vietnam, they cannot be processed immediately. However, these traits should be taken into account when making recommendations for the establishment of Thanh Hoa campus of University of Industry in Ho Chi Minh.

(1) There is a very complicated education system, vocational training

Vietnam is focusing its efforts on training and education to provide training for industry personnel. Vietnam has a long history of respecting vocational training; many training institutions including the HUI initially were vocational training schools then have been upgraded to the University. At that time, some school only stopped in keeping the same initial education and training system which not belonging to the University System to apply into the University, some others however, become complex systems such as HUI School.

(2) No match between labor demand and labor supply

Also due to heavy industry and petrochemical industry to grow, between the labor demand and labor supply- school side is no match. University increase considerably in number so the number of graduates has also increased, leading to a number of engineers or technicians increased, making the excess of supply. The content being trained in schools does not help students immediately after working out. According to OBELCO example, when hiring administrative staffs in charge of general matters which need English proficiency, the candidates are mostly English teachers with no experience in business practices, they cannot use the business English, so they can not be recruited. Mostly between training schools and industry there is no mutual communication, the school did not investigate the work of graduate students either. Hence, the training of human resources for the needs of industry faced difficulties.

(3) Too much respect the degrees leading to the ignorance of working skills

In Vietnam, the percentage of students proceeding to university is quite low, only 10%. Those university graduates form the elite of society. This class difference is quite clear about the salary, treatment regime compared with the non-class elite. This is also reflected quite evident in both the staffing and career development plan... of business.

There are large disparities in wages and wage growth, career choice between the managers,

engineers with university degree with technician graduated from upper college level or lower level. This prompted the will of the school pupils to university students. The schools from upper college down tend to focus on the practical training and training lightly on theory, this trend is believed to affect the higher education system.

However, business can not be formed if only to graduates of the University management and engineers. In technical areas, not just engineers, but also need to have excellent technician productivity. In Vietnam, the proportion of the University graduation rate is about 10% and upper college graduates accounting for 50% and most of the technical staff are technicians. According to information heard from a company of heavy and petrochemical industries, it has been suggested that "A good technician is better than a bad engineer." But in fact, society has not fully aware of the importance of the training of technical team of excellent technicians

- (4) In the University system (management by MOET) and vocational system (management by MOLISA), the vocational one is preferred with social awareness

Most people in society are aware that it is more profitable to precede professional system than the vocational system. Normally, the professional training focuses on the theoretical higher level, while it is easier to graduate in the vocational system. In addition, currently the businesses do not care whether a student graduates from a professional or a vocational system at employment.

Just being able to receive graduate diploma at the same level, and if considered to be no gap when apply for job there should be a tendency to select the easier system to enter i.e. the vocational system. This issue has a social character. On the other hand, it is also suggested as the vocational system puts focus on the practical skills which is beneficial for job employment.

According to the findings described in (3), (4), education in Vietnam tend to split into two directions that a university education and employment. This is reflected also in the company, graduate students working in the company as a manager or engineer with a high sense of belonging to company, wants to work, gradually created for progress the elite. But other employees' weak sense of belonging to company, weak desires to work, low desire for progress, and there are employees with "feeling to additional work." Employees find that structure so natural, it is Vietnam culture, and there is a wall of separation between the staff of the elite and not elite. The similar staffs trend to create groups, not in accordance with Japanese corporate culture with a sense of belonging to company, high desires to work.

## 4.2 The findings in HUI-TH

Referring to the above key findings, the investigation group took the faculty of technology, HUI Thanh Hoa campus as the model to make suggestions to enhance the training activities as follows:

- (1) The system of Faculty of technology HUI-TH campus has become too large in number

Being a training establishment, the school is very large in number: Upper Professional College, Upper Vocational College, and Lower Professional College (2 years). For each training system there are Transitional courses with different routes. For example, Faculty of technology has 8 fields (if including sub-field are 9), if multiplied with 6 systems i.e. Universities, University Transitional from upper college, Professional Upper Colleges, professional lower level, the Upper College Transitional from lower college, Vocational Upper College will make 54 professions, courses<sup>1</sup>.

In addition, educational institutions, professional and vocational training systems of HUI-TH are preparing students for the 193 types of work. The faculty of Technology of HUI-TH is divided into 9 sectors, and with the perception that "to prepare the number of faculties equivalent of the type of work."

Also, there are problems in obtaining statistical data. Complex systems, no good statistical regime it cannot easily capture the number of students, numbers of students dropout of the year of the different courses.

- (2) Shortage of teacher, having taught a variety of different contents in many training system is a burden for teachers.

The number of teachers in HUI pretty much compared to teacher ratio 1/9 students of Akita technical upper colleges –agency providing personnel training for heavy and petrochemical industries in Japan.

In the HUI, one teacher teaches many subjects and at the same time for many courses. Moreover, most of the HUI teachers are qualified under master level. Compared with the College of Akita which has 66 teachers, of which 59 are PhD, 7 teachers are Masters, this figure of HUI is very different.

- (3) Curriculum content, textbooks are so seriously focus the practical application

The content of school textbooks of HUI equivalent to the curriculum of the Faculty of Mechanico-Physical of Akita Upper College but the HUI-TH focused on practical education the teach content lacks the basic theory to explain that students how can find out the results making the textbooks same as "instruction manual" (How to). And part of curricula training on basic theory to help

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<sup>1</sup> Actually there are 23 types of teaching programs are being implemented (see Section 3.2.9)

students to judge is missing. In addition, curriculum content spread too widely. In term of teaching time for the same subject with the one of Akita Upper College, the teaching time is shorter here. Moreover, schools do not actually use the equipment at the request of the industry.

Professional system of HUI-TH campus is operating under the motto "Compared to other schools, the professional system also trained many of the practical application, should be able to train students to be more fully studied in terms of applications ", and put importance on the general concept " Students have learned more content of practical application more easily find work. "

(4) There is much in need of improvement in teaching methods of teachers

Teachers still have not invested much time. The dean of Technology Faculty herself deployed many hours of study and attended many hours of faculty members, leaving little time to look for teaching methods more suitable for students

(5) Lack of needed books, reference materials

When observing instruments, laboratory equipment of the Faculty of technology HUI-TH campus, one can find that tools are used for analysis, but out of those tools, most are incomplete. In addition, most books in the library are textbooks, lack of reference books for learning the basic knowledge.

(6) Schools are not interested in the work; futher study of the graduated students

HUI-TH has almost no relation to the units in the industry. Therefore, the school does not understand the HR needs of the industry and can not train graduates to contribute to the industry. On the other hand, schools are not interested in the work of graduate students neither the place of students work after graduation

### 4.3 Recommendations to improve

The following describes the proposed improvements to the problems found on the HUI-TH.

It should be set up the Strategy for HR development (HRD) with the perception to build the human resources called technicians and career path while working.

In manufacturing enterprises such as heavy and petrochemical industries, it can not operate machinery and equipment with only the managers and engineers. In fact, great number of operators of machinery and equipment is technicians.

Human resources that businesses are looking for are not only technicians prepared in the vocational establishments, they should be the "creative person", "qualified person" equipped with the knowledge, basic principles in school, able to catch that knowledge and judge. The schools, need to study carefully about these points as "how good technician is like?", "How to train technicians is like?" and then propose "training philosophy "as" what are the people the School want to train like?"And consider on how to prepare the system for training in higher education.



It should try to capture the needs of the business, build mechanisms that can provide content and training programs to meet those needs.

#### **4.4 Detailed Recommendations**

The investigation team analyzed the problem from the viewpoint the countermeasures should be feasible, and has proposed the following measures to strengthen. And to prepare the recommendations, the survey group has referred to the upper college's regime of Japanese and based on above key findings, the survey team took Faculty of Technology of HUI Thanh Hoa campus a base model to make recommendations to enhance the training activities as follows:

In Japanese there is an excellent mode "Technical upper college" used to train technicians. Points can be learned from the technical professional colleges are many, however here are just examples described in part by comparing the content with Akita Technical Upper College.

##### **(1) Strengthening management:**

It should clarify the motto of the school training, and provide direction for creating human resources like. On the other hand, by being aware the complex regime of the school, one can grasp correctly the status of university general situation, improved management systems and management processes, increase operational activities of the school to capture the actual situation of each student, each teacher.

Especially there is the need to adjust how to get statistics that can be easily understood number of students in schools, through which one can understand the school situation.

##### **(2) Strengthening teacher 's teaching capability**

The entire faculty of Akita Technical College are PhD and masters which making it possible to put important on the theoretical training. So, in HUI-TH it also encourages the taking of master's degrees, doctoral degree among faculty members.

On the other hand, to improve teachers' teaching methods such as guiding methods, teaching methods. Need to take steps for the faculty members together strengthen teaching capacity as conduct preparation of guidelines on methods of teaching, sharing teaching methods in schools, research organizations and teaching sessions in and out school

##### **(3) Review training programs and improve teaching facilities**

Especially need to learn how to teach knowledge to the industry needed such as oil refineries, etc ... to train people with intellectual skills, high quality to provide for the Nghi Son economic zone, and progress improvement of teaching tools to match.

##### **(4) Strengthening relationships with the private business of the industry**

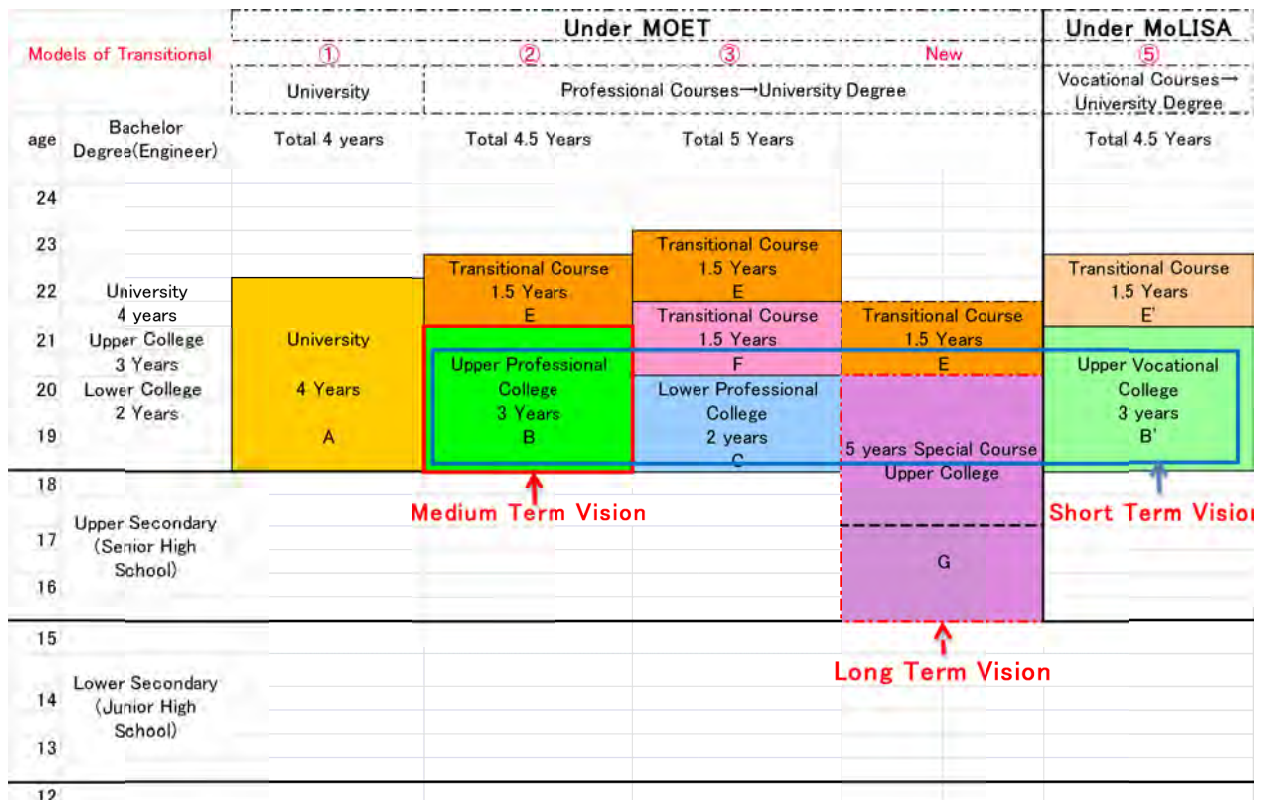
In Akita Upper College, the school has a close relationship with the enterprises in the industry by sending students to practice or internship. In addition, the school also built relationships with the private sector through the graduate students and a survey of student employment after graduation

HUI-TH also need to periodically visit the businesses and asked directly about corporate human resources needs, ask about the assessment of business on the graduates for the purpose of strengthening relationships with industry.

The industry to send faculty, receive students for practice, field trips, apply practical regime, preferential employment of graduates of the specified training courses invest in the "invited experts or secondists" for the purposes of strengthening the education sector indicated, and scholarship support to students excelled, providing equipment and consumable supplies for the training systems in order to specify the purpose of enhancing improve the content of school education.

#### 4.5 Vision on short, medium and long-term

When implementing the improvements suggested above, should be divided into short-term vision, medium and long term and directions mapping, implementation plans as described in Chart 4-1



***Chart 4-1: Enhanced Vision of the HUI- TH***

*Note: the dashed line is the part that does not exist currently*

*(Source: created by hearing information)*

#### **4.5.1 Short-term vision:**

To enhance the important subjects in heavy industry and petrochemical and faculty that teaching those subjects.

Conduct enhanced support for indicated subjects of the Lower Colleges system (2 years), Upper College (3 years) (marked blue on the Chart) include strengthening management, enhancing teaching equipment. The objected fields are such as the petrochemical industry, etc...

#### **4.5.2 Medium-term Vision: To enhance the Professional Upper Colleges system (B)**

Implement enhancing measures based on short-term vision. From that status, could enhance the indicated system: the professional upper colleges.

#### **4.5.3 Long-term vision:**

Develop educational programs, implement appropriate technicians training in accordance with heavy industry and petrochemicals such as in KOSEN

In future, the good points of the technical upper college in Japan will be referred and created "The curriculum must have", visualize the "Image must have in the future" of Vietnam society such as the reconcile the hierarchy between engineers and technicians, implement appropriate training technicians in accordance with heavy industry and petrochemicals.

#### **4.6 Proposed specific plans to prepare for implementation of short-term vision**

Pay attention to the implementation of "short-term vision" described in 4.4, and proposes to make specific plans prepared by Vietnam side as follows:

Purpose: To enhance the teaching content, teaching methods of the subjects related to heavy industry and petrochemical in Faculty of Technology HUI-TH campus thru putting to use training equipment needed and management improvement.

Subject: The selected Petrochemical Field, etc. ... of the 9 fields of Faculty of Technology to be used as model.

Contents:

#### 4.6.1 To enhance faculty

Scenario: Compare, check the balance of basic and specialized subjects, the balance of theory and practice, a deep level of content, the correctness of teaching methods, etc ... to bring a method for improving curriculum or methods to improve textbooks, teaching equipment. Through the determination of content for teachers to teach students, will offer a plan to improve teaching methods of teachers. Since then, improving attendance subjects related to heavy industry and petrochemical students.

Strengthening the capacity of chairman of the discipline, and chairman of the industry so that they can help strengthen the ability of other faculty.

Action:

- (1) Verify the status of the HUI-TH
- (2) Verify the needs of businesses personnel relating to corporations Vietnam
- (3) Check the current curriculum, lesson plans, textbooks
- (4) Checking teaching methods, methods of textbooks utilization, experimental educational methods
- (5) Review improvements measures based on survey results
- (6) Meeting to discuss plans to improve
- (7) Implementation of improvement plans

#### 4.6.2 Strengthening the school business:

Scenario: Supporting activities of the teacher, making the setting up business strategy becomes easier. On the other hand, by improving the management capacity to be able to strengthen relationships with business as universities, to support improved teaching content or teaching methods and improve participation study in subjects related to heavy industry and petrochemical students.

Action:

- (1) Confirmation of current business status of HUI-TH
- (2) Consider improving the business plan of HUI-TH

#### 4.6.3 Strengthening and equipment of schools teaching

Scenario: Gather information about the equipment needed for teaching content needed for heavy industry and petrochemical, latest equipment and bringing it into use. Since then raise the level of training content, increasing capacity of teachers, and consequently improve school capacity involved subjects related to heavy industry and petrochemical students. Action:

- (1) Certification of the teaching facilities HUI-TH
- (2) Certification training facility of the upper college system ,of Akita Technical Upper College
- (3) Collect the opinions of enterprises in Vietnam
- (4) Create a list of teaching equipment
- (5) Certification of the equipment specification
- (6) Confirmation of measures to enhance equipment
- (7) Implementation of measures to enhance equipment

The equipment needed is teaching equipment to facilitate education and learning theory is being used at colleges in Japan.

·Super Speed Centrifuge	X-ray diffraction analysis of
· Analysis dynamometer, Spectrometer	high-performance
· Equipment continuous multi-stage distillation	· Measurement of nuclear magnetic resonance
· Gas chromatography	spectrum
· Equipment · Differential thermal analysis	· High-performance liquid chromatography
equipment	· Equipment used mass spectrometry analysis
	with gas chromatography
	· Ion chromatography

*Table 4-1 Example lists equipment to facilitate education*

*(Source: Akita Technical College, 2007, 2011)*

#### **4.7 Other enhancing measures and the necessity of English Education**

From the example of the Dung Quat oil refinery, the problem of communication with foreigners in the work process is so important that English language is essential. One can not say that Thanh Hoa province has many students regularly exposed to English. In the HUI, to graduate, students must achieve a certain level of English. If students have not reached the corresponding level may attend advanced courses at the Center for English (English Institute) at the HUI campus in Ho Chi Minh. The HUI-TH campus also needs to improve their English.



Chapter 5

Conclusion

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## **5. Conclusion**

In these surveys, collected data is provided by the Ministry of Industry and Trade, Ministry of Invalids and Social Affairs, Ministry of Education and Training of Vietnam, the People's Committee of Thanh Hoa province, the Department of Industry and Trade, Department of Education, Invalids and Social Affairs Department, Department of Planning and Investment, Nghi Son economic Zone company, University of Technology of Ho Chi Minh, Petro Vietnam, Dung Quat oil refinery company, the Dung quat College of Engineering, Dung Quat economic zone company, Idemitsu Corporation, Nghi Son cement Corporation, JSC Kobe steel Fabrication. Specifically, the campus management-HT HUI University of Technology of Ho Chi Minh accurately capture the intent of the survey team, has actively supported the survey team under the direction of the main campus in Ho Chi Minh , has overcome the language barrier, and although hampered by the school system, also prepare the necessary data with great enthusiasm from the beginning until the end of the survey. Also, thank the teachers and students of Faculty of Technology participated in the group discussion even though they busy on learning or teaching.



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