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**Curricular planning of upgrading the practical and professional competence
of students in Technological Colleges**

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Introduction

It is expressly provided that technology colleges shall have the incubation of advanced technology talents as their goals in the draft of Republic of China (ROC) Technology Occupational Colleges. However, as the technology advances by second, the modern society undergoes rapid transitions, and the demands of the manufacturing industry changes at a snap (Cheng, 2003; Chang, 2001); curricular planning requires readjustment at any minute to cope with the needs of the time (Foray, 1999). In the past, the department-based curricular design appears too rigid and is far away from being flexible, thus fails to adapt to the modern learning environment featuring fast explosion of accumulated information (Wu, 2000; Wiles & Bondi, 1979). Students attending technology colleges come from different backgrounds. In a time having emphasis on diversified entrances in the wave calling for reformation of education, the trained capacities of the students before entrance shall be respected (Mohr, 2003; Miller, 1996). Students shall be allowed to have free choice of the subjects for studies in the college depending on the individual learning scope.

The flushed type of equity of learning and the department-based curricular design of the professional learning shall be waived to give away for considering the trained capacity, aptitude and interest of the individual student (Fierro, 2003). Courses with similar properties shall allow independence for each discipline in seeking the inter-discipline integrated and professional course-based curricular design for the students to have options of courses from different disciplines by taking individual interest and abilities into consideration, thus to achieve the purpose of fully utilization of the social and the academic resources for the construction of an inter-discipline and multiple professionals oriented curricular design (Hawkes, 2001; Teichler, 1949).

Methodology & Approaches

There is the inherited and unavoidable time lapse between the preparation education and the graduation in the educational system of technical occupation. There will be a span of one

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up to four years of time fall in facing the demands of the industrial world while entering into the job place. As the social transition and the advanced technology change at a quickened pace, how to predict the future and clarify the vision of the industrial world to plan an education system for the new century with an even advanced vision, it is expected that students graduated from colleges of technology are all equipped with the basic professional training needed by the future kingdom of architecture, and the basic inter-discipline competence involving multiple fields and professionals (Murray, 2002; Taba, 1962). The curricular planning shall warrant that students are prepared with even wider and deeper occupational technique in facing the possible readjustment of the industrial structure in future and the adaptability in coping with the structural unemployment resulted from such readjustment (Lee, D & Wang, C, 1997; Stenhouse, 1975).

Accordingly, the primary objectives of the study are:

1. Coping with the rapid transition in the social and economic structures, and incorporating the experts from the industry, the government and the academy to carefully predict what professional capabilities and techniques required by the architectural world in future.
2. Compromising those requirements of professional capabilities and techniques by the architectural industry in the exploration, planning and setting forth the professional capabilities and techniques that should be developed in the curricular design of architecture by the colleges of technology.
3. Providing the combined course of professional capabilities by reviewing the present courses offered at department of architecture within the framework of department courses in conjunction with the curricular configuration for the technical planning as described in the preceding two subparagraphs to achieve proper planning.
4. Respecting the trained capacities of the students before entering into the colleges of technology in cautious preparation of standards for the review of each professional capability and technique to come up with a set of strict certification system for the recognition of the learning on and off campus; eliminate flaws found with the overlapped structures existing in the three levels of occupational education (high vocational schools, junior colleges and colleges of technology); and summarize the learning hours for the students to have inter-discipline studies in developing their professional abilities in multiple specialties and fields.
5. Developing the criteria for the examination of the basic proficiency in preparation of each professional technique and ability, as well as the criteria for determination of those professional abilities and techniques the student should possess upon completing the study for the students to follow in taking up the optional courses.

A. Issues of the Study

Issues of the study are divided in six parts, respectively, the courses of architectural structure, constructional practices, architectural management, architectural design, architectural development and architectural facilities in sequence, determined in seminar held by the author using DACUM format in setting forth the curricular subjects for each profession of architecture. All these six parts have been produced by experts upon their professional angles and the demands from the industries, and are justified and feasible. Therefore, these six parts shall be incurred with issues of appropriateness, organization and merge, and all those issues required

subsequent exploration and study in details before they are solved.

B. Methodology of the Study

To achieve its purposes, documentary analysis, DACUM experts seminar, to define the basic items for the professional training in architecture, questionnaires of expert interviews to collect comments from experts related to education of architecture, and finally all the data available are given cross and statistical analysis, compiled and reviewed to result in conclusions and recommendations.

Methodology:

1. To establish issues of the study and their significance:

Define the nature and background of the issue of the study, and predict the future demands based on the domestic architectural industry status quo so to establish the curricular planning of each professional ability and technique of architecture departments in colleges of technology.

2. To define the purpose and scope of the study:

The purpose of the study is defined as such that the department of architecture in a college of technology shall be equipped with the professional ability and technique, and required to develop those abilities and techniques that should be commanded and the basic pre-study abilities of each professional discipline.

3. To collect documentation both at home and overseas:

To comprehensively collect documentations at home and overseas by inter-library cooperation programs, international academy networks and published libraries and magazines to serve as the importance references for the underlying theories of the study.

4. To call for DACUM meetings:

Expert seminar and experts from the industry, government and academy are invited to hold DACUM experts seminar to specifically define those professional items that should be developed via the curriculum of the college of technology to cope with the fast transition in the social and economic structures.

5. To interview with local scholars of architectural education and experts from the architectural industry:

Careful prediction of the future technical requirements of the architectural industry in future, and the details of those requirements are prepared after the DACUM experts seminar before having interviews with experts from the industrial, governmental and academic fields to come up with the prototype of the draft of the questionnaires.

6. To prepare questions:

Systematic understanding and analysis are attempted in terms of the educational needs by the architecture related industries, followed by variance comparison between the function of the curricular planning and the design of the conventional curriculum.

7. To have expert seminar and develop questionnaires:

Two rounds of seminar have been held by inviting experts from the industrial, governmental and academic worlds to seek their comments and modification on the draft of the questionnaires and the questionnaires of “curricular planning of abilities and techniques of each profession for the courses of architect department in colleges of technology“ are finally developed

8. To mail and assort the questionnaires: 100 copies of questionnaires are mailed and returned

with 66 valid replies after many times of follow up in writing and by phone.

9. Statistical analysis:

For the study, SPSSWIN package software is used to conduct the statistical and cross analysis of those 66 valid questionnaires returned.

10. Production of report:

Findings are summarized to prepare the report of the study based on the theoretical fundamentals resulted from the documentary exploration and results of analysis of the survey by questionnaires.

C. Scope of the Study

The study seeks to a curricular planning in conjunction with the professional technical requirements of the architectural industry in future for the students when graduated are equipped with one or more than one specialty while establishing the opportunities for cooperation with the industry for the students to earlier be adaptive to the industrial requirements and in turn welcome by the industry for the employment. To achieve the purpose, the scope of the study is described as follows:

1. 60 schools maintaining architecture related disciplines are selected from multi-college universities and colleges of technology in terms of the purpose of the study, and subjective interpretation and judgment and each school is mailed a copy of the survey questionnaires.

2. This study only on the exploration into the curricular planning of the professional ability and technique of architect department in a college of technology that meets the future demands of the industry, topics involving the system accommodating the objectives, flow and configuration of teaching and learning of the course of architecture as a whole are left for the subsequent studies to have deeper exploration.

Bearing the purpose of the study in mind, subjects receiving the questionnaires are classified into seven groups, respectively, teaching faculties from university (college of technology), junior college, high vocational school, industrial design, graphic design and spatial design as well as the employees from the architecture and constructional industries.

Curriculum of Architectural Design (example):

Model 1: whether the extent of significance of each item in the curriculum of architectural design in the practical technique and practical knowledge at present varies among the architectural and constructional industries?

Model 2: whether the extent of demands of the contexts of each item in the curriculum of architectural design in the practical technique and practical knowledge at present varies among the architectural and constructional industries?

Model 3: whether each item in the curriculum of architectural design in the practical technique and practical knowledge at present and as predicted five years later vary among the architectural and constructional industries?

Model 4: whether the extent of demands of each item in the curriculum of architectural design in the practical technique and practical knowledge at present and as predicted five years later (2002-2007) vary among the architectural and constructional industries?

D. Tools for Analysis of the Study

Data collected for the study when having been completed with the coding and entry are analyzed with SPSSWIN. The statistical method used by the study is described as follows:

1. r test: to test the creditability on the questionnaires for both groups (e.g. practical technique and ability vs. practical knowledge) of the same item in each model, then correlation coefficients are solved before entering t test.
2. t test: to conduct first the assumption test (with the significant level as $p < 0.05$) and solve the mean of each item in both groups to judge the extent of application while solving the value of t to determine the significance of variance in the extent of application.

E. Survey Samples of the Study

Population, divided into four levels, respectively development company, constructional contractor, architect office and related departments in college, of the industry of architecture and construction is retrieved from the website of architectural world (www.arch-world.com.tw) at random by research staff. Each level of population is respectively given its ratio and samples are taken at random according to the list of fuzzy made using Microsoft Excel 8.0. There are 100 samples in total. Samples are taken as illustrated in the table below and the return rate of the questionnaires is 66%.

Table 3-1: Survey Sampling

Level	No. of Sample	%	Valid Return
Development Company	20	10	6
Constructional Contractor	20	20	11
Architect Office	20	20	13
Architecture related departments	40	50	25
Total	100	100	66

F. Development and Design of Questionnaires

Items comprised of six parts, respectively, courses of architectural structure, constructional practice, architectural management, architectural design, architectural accomplishment and architectural facilities created by means of DACUM experts conference. Each item is assigned a set of matching topics including the extent of application of the practical ability and technique by the industry, the extent of demands on the practical knowledge by the industry, and the extent of demands on the curricular context of architect in college of technology respectively status quo and as predicted for five years later to avoid the absence of the future sense in the curricular context.

1. Development of Questionnaires:

- (1) Establishing the orientation for the study by referring to related documentation;
- (2) Collecting the data for the questionnaires and defining the leading direction for the questionnaires by the research staff;

- (3) Holding first round of experts meeting of DACUM to seek the items for the questionnaires;
- (4) Data compilation to prepare the draft by the research staff;
- (5)Holding the second round of expert meeting to finalize those professional items of technique and ability that should be given in the curriculum of architecture;
- (6) Modifying the draft of the questionnaires;
- (7) Carrying out the internal test of validity of the questionnaires;
- (8) Analyzing the validity and modifying the questionnaires; and finalizing the contents of the questionnaires.

2. Contents of Questionnaires:

The questionnaires for the study are titled with “Survey Questionnaires of the Curricular Planning for Upgrading Professional and Practical Proficiency of Students from the Discipline of Architecture”. Additional to the brief introduction, the contents are divided into two parts:

(1) Basic Particulars:

Basic particulars are used to understand the academic system of the college, the major, current job classification, and correspondence address for requesting the results of the questionnaires of the respondent. In the academic system, the respondent is asked to check from 1. High Vocational School, 2. Junior College, 3. College or University of Technology (Graduate School excluded), 4. High School, 5. General University, and 6. Graduate School including that offered by the general university and college of technology. As for the major, the respondent is asked to check from 1. department of architecture, 2. Department of Architectural Engineering or Architectural Technology, 3. Design related department (to be specified), 4. Architecture and construction related engineering department (to be specified, and others).

As for the current occupation, the respondent is asked to check from 1. practicing Architect, 2. employee in the trade of architecture and construction (other than the practicing architect), 3. professor of architecture and construction in colleges, 4. instructor of design and other engineering related to architecture and construction in college, and 5. others (to be specified). Furthermore, the respondent is asked to complete address, telephone number, fax number, and/or E-mail address if he or she desires to be kept informed of the results of the questionnaires.

(2) Questionnaires on the Demands of Practical Proficiency in Architecture, Architecture and Construction and Curricular Context of Architecture in Colleges of Technology:

This part is the focus of the questionnaires and is further divided into six subparts of the courses of architectural structure, constructional practices, architectural management, architectural design, architectural accomplishment and architectural facilities. Within, the curriculum of architectural structure is further divided into the application of architectural materials in architectural structure, dynamic behavior impacts upon architectural structure, and application of structural system in architectural structure. Constructional practices are further divided into constructional technique and related affairs, architectural management and practical competence, site probation, QC (Quality Control) and QC practice.

Architectural management is further classified into land and architectural (immovable properties) development, land and architectural (immovable properties) management and administration, land and architectural (immovable properties) service management, and architectural planning, design and operation. Architectural design is further divided into basic design (human dimension, graphical design, elevation styling and quality presentation), architectural design, architectural detailed design, materials planning and drawing integration competence, and architect office practice (operation) competence. Architectural accomplishment is further classified into historical development, cultural development, ecology and environment development, and artistic development. Since architectural facilities allow further classification by the nature of the facilities and the nature of the course, the architectural facilities is further divided by the nature of the facilities into electric appliance system and practical weak electric system (including the grounding system) and practical drainage and water supply system, practical fire facilities and practical air conditioning system.

On the other hand, the architectural facilities are further divided by the nature of the course into architectural civil utilities systems and practices, architectural air conditioning system and practices, fire facilities systems and practices, equipment systems integration and drawings. Meanwhile other options for voluntary reply are provided additional to each question and the respondent is asked to pick up the most and the least significant items.

G. Dispatch of Questionnaires

First, experts from various disciplines in the first round of the DACUM experts meeting confirm the details of the items in the questionnaires. Results are compiled by the research staff to develop the prototype of the questionnaires to be reviewed by the experts in the second round of the DACUM experts meeting for the development of the draft of the questionnaires. Meanwhile, internal validity test is given to the questionnaires. The formal questionnaires are finalized by the research staff according to the conclusions drawn from both rounds of the experts meeting and the results of the internal validity test.

100 comprised of 20 samples each for three levels of samples respectively from development company, constructional contractor, architect office and 40 samples of architectural related departments of the colleges are determined after the sampling by level of the population for the subjects of the questionnaires. Valid returns of questionnaires are comprised of 6 from development companies; 13, architect offices; 11, constructional contractors; and 23, related academic departments. Sampling by level allows sufficient wide coverage of the subjects of questionnaires to achieve the creditability of the questionnaires. Contents of the questionnaires are made more effective since they have been prepared and reviewed by experts. Such a process for the development of questionnaires makes the findings of the study more creditable and justified.

All the 100 copies of questionnaires are delivered to the subjects by mail. A follow up to demand the reply is done by phone two weeks after the mailing date. The deadline is set on June 16, 2002 and 43 copies have been received. The same questionnaires are mailed on that same day to those have not yet responded. As a result additional 23 copies are received for the return rate to hit 66%.

Conclusions and Recommendations

Six major courses respectively, architectural structure, architectural practices, architectural management, architectural design, architectural development and architectural facilities have been created after completing the flow of study including documentation reviews, experts seminar and survey by questionnaires. This section is comprised of two sections, respectively dealing with the conclusions and recommendations of the study.

A. Conclusions of the Study

Conclusions of the study are consensus from experts seminar:

1. Ten disciplines are provided under each program and approximately a total of 30 credits (approximately) are provided. For the student major in architecture, credits from architectural development and two or more than two architecture courses are required while optional courses from other departments are permitted. The student must complete a total of 128 credits before receiving the diploma.

2. For audits, the student has to take up courses of architectural development offered in three or four subjects, all core subjects of architecture to test whether the student is committed to his/her interest in architecture.

3. Though the curriculum of the department is changed to several courses, the meeting has reached a consensus not to change the configuration of the existing academic system until the course planning has come to a certain level of maturity

Educational objective for each course is respectively described as follows:

(1) Architectural structure course: to develop the student the abilities to command the design and planning competence of civil engineering and architectural engineering, planning and monitor the progress of structural engineering, and construction, maintenance, betterment and repair, and further to be specialized in the field of structural engineering to become a talent of architectural structure.

(2) Architectural practice course: to develop the student the abilities to assist in helping site survey, recording the measurements, test and taking inventory of materials, architectural construction, betterment, repair and maintenance, and design of civil engineering structure, thus to achieve agile application of principles of architectural and civil engineering and constructional knowledge in helping solve problems and difficulties of drawings or site.

(3) Architectural management course: essentially to reinforce theories and experience of urban growth management planning, and to improve the understanding of the existing and future urban environment for the development of the student the know how of theories and practices by understanding the basics of strategic and prospective approaches through the introduction of characteristics and general topics of urban growth management experience.

(4) Architectural design course: To familiar the student with the operation of the concepts and flow of design to develop through continuous learning and innovation of design ideas the basic architectural design competence and the professionalism of constructional architecture, thus to

become the talent of design with vision.

(5) Architectural accomplishment course: to develop the student the overall understanding of the architectural history, and the ideas and interests of architecture, thus to have in-depth knowledge of the context of architecture and the humane and architectural quality.

(6) Architectural facilities course: to develop the student theories and functions of various types of facilities to properly and specifically select the facilities in the design, structure and facilities in the design of architecture for achieving the purpose of well coordinated planning as a whole.

Among the personnel engaged in architecture and its related industries in Taiwan:

- (1) 48.5% majored in department of architecture, and
- (2) 27.3% are now engaged in architectural and/or constructional companies.

Conclusions drawn from the analysis of the study for the courses of architectural structure are described as follows:

(1) According to the industry, the application of architectural materials in the architectural structure is ranked at the top and the application of structural system in the architectural structure stays at the bottom for those three subjects of the courses of architectural structure at present wherein practical knowledge is deemed as being more important than the practical technique and ability.

(2) According to the industry, impacts of dynamic behavior upon the architectural structure is ranked at the top and the application of architectural materials in architectural structure stays at the bottom for those three subjects of the courses of architectural structure at present wherein the extend of demand of the context of architectural curriculum in college of technology is deemed as being more important than the practical technique and ability.

(3) According to the industry, the application of architectural materials in the architectural structure is ranked at the top and the application of structural system in the architectural structure stays at the bottom for those three subjects of the courses of architectural structure at present wherein practical knowledge is deemed as being more important than the extend of demands of the curricular context of architecture in college of technology.

(4) Areas calling for emphasis of the extent of important five years later as predicated by the industry are:

a. The application of architectural materials in architectural structure is ranked at the top in terms of the applied practical technique and ability of structure;

b. The application of structural system in architectural structure is ranked at the second place in terms of the applied practical technique and ability of structure; and

c. The application of architectural materials in architectural structure is ranked at the bottom in terms of the applied practical technique and ability of structure.

Conclusions drawn from the analysis of the study for the courses of architectural practices are described as follows:

(1) According to the industry, the Quality Control and Quality Control (QC) practices are ranked at the top and the site probation stays at the bottom for those four subjects of the course of architectural practices at present wherein practical knowledge is deemed as being more

important than the practical technique and ability.

(2) According to the industry, the QC and QC practices are ranked at the top and the site probation stays at the bottom for those four subjects of the course of architectural practices at present wherein the extent of demands of the curricular context of architecture in college of technology deemed as being more important than the practical technique and ability.

(3) According to the industry, the work technique and related affaires are ranked at the top and the architecture and construction management and practical ability stay at the bottom for those four subjects of the course of architectural practices at present wherein practical knowledge is deemed as being more important than the curricular context of architecture in college of technology.

(4) Areas calling for emphasis of the extent of important five years later as predicated by the industry are:

a. QC and QC practices are ranked at the top in the practical technique and ability applied in architectural and construction practices;

b. Architectural and construction management and practical abilities applied in architectural and construction practices is ranked at the second place in the practices of the application in structure; and

c. The practical technique and ability for the application of work technique and related affairs in structure are ranked at the bottom.

(5) The item of “architecture and construction management and practical ability” is ranked at the top for the most important item for the extent of demands of the curricular context in the department of architecture of colleges of technology five years later, and the item of “work technique and related affairs”, the least.

Conclusions drawn from the analysis of the study for the courses of architectural management are described as follows:

(1) According to the industry, architectural planning, design and business operation are ranked at the top and the land and architecture (immovable properties) stay at the bottom for those four subjects of the course of architectural management at present wherein the practical technique and ability are deemed as being more important than the practical knowledge.

(2) According to the industry, architectural planning, design and business operation are ranked at the top and the land and architecture (immovable properties) service management stays at the bottom for those four subjects of the course of architectural management at present wherein the practical technique and ability are deemed as being more important than the demands of the curricular context of the department of architecture in colleges of technology.

(3) According to the industry, the development of land and architecture (immovable properties) ranked at the top and the land and architecture (immovable properties) operation management stays at the bottom for those four subjects of the course of architectural management at present wherein the practical knowledge is deemed as being more important than the demands of the curricular context of the department of architecture in colleges of technology.

(4) Areas calling for emphasis of the extent of important five years later as predicated by the industry are:

a. Practice and knowledge for the application of the land and architectural (immovable properties) business operation management in the architectural operation are ranked at the top.

b. Practice and knowledge for the application of the land and architectural (immovable properties) service operation management in the architectural operation are ranked at the second place.

c. The practical technique and ability for the application of building planning, design and business operation in the architectural operation is ranked at the bottom.

(5) The item of “land and architectural (immovable properties) development” is ranked at the top for the most important item for the extent of demand of the curricular context in the department of architecture of colleges of technology five years later, and the item of “land and architecture (immovable properties””, the least.

Conclusions drawn from the analysis of the study for the courses of architectural design are described as follows:

(1). According to the industry, architectural detailed design, materials planning and competence of drawings integration are ranked at the top and architectural design stays at the bottom for those four subjects of the course of architectural design at present wherein the practical knowledge is deemed as being more important than the practical technique and ability.

(2). According to the industry, basic design is ranked at the top and architectural detailed design, materials planning and competence of drawings integration stay at the bottom for those four subjects of the course of architectural design at present wherein the demands of the curricular context of the department of architecture in colleges of technology are deemed as being more important than the practical technique and ability.

(3). According to the industry, architectural detailed design, materials planning and competence of drawings integration are ranked at the top and architectural design stays at the bottom for those four subjects of the course of architectural design at present wherein the practical knowledge is deemed as being more important than the practical knowledge.

(4). Areas calling for emphasis of the extent of important five years later as predicated by the industry are:

a. Practical knowledge for the application of architectural detailed design, materials planning and competence of drawings integration in the course of architectural design is ranked at the top.

b. Practical technique and ability for the application of architectural detailed design, materials planning and competence of drawings integration in the architectural design are ranked at the second place.

c. The practical technique and ability for the application of the basic design in the architectural design is ranked at the bottom.

Conclusions drawn from the analysis of the study for the courses of architectural practices are described as follows:

(1) According to the industry, historical accomplishment is ranked at the top and artistic accomplishment stays at the bottom for those four subjects of the course of architectural and construction practices at present wherein the practical knowledge is deemed as being more important than the practical technique and ability.

(2) According to the industry, cultural accomplishment is ranked at the top and historical accomplishment stays at the bottom for those four subjects of the course of architecture and construction practices at present wherein the demands of the curricular context of the department

of architecture in colleges of technology are deemed as being more important than the practical technique and ability.

(3) According to the industry, cultural accomplishment is ranked at the top and historical accomplishment stays at the bottom for those four subjects of the course of architecture and construction practices at present wherein the demands of the curricular context of the department of architecture in colleges of technology are deemed as being more important than the practical knowledge.

(4). Areas calling for emphasis of the extent of important five years later as predicated by the industry are:

a. The practical technique and ability for the application of the accomplishment of environment and ecology in the accomplishment are ranked at the top.

b. The practical knowledge for the application of the accomplishment of environment and ecology in the accomplishment are ranked at the second place.

c. The practical technique and ability for the application of the artistic accomplishment in the accomplishment is ranked at the bottom.

(5). The item of “environmental and ecological accomplishment” is ranked at the top for the most important item for the extent of demands of the curricular context in the department of architecture of colleges of technology five years later, and the item of “artistic accomplishment”, the least.

Conclusions drawn from the analysis of the study for the courses of architectural facilities are described as follows:

(1) According to the industry, weak electric system and practices are ranked at the top and air conditioning facility and practices stay at the bottom for those five subjects of the course of architectural facilities at present wherein the practical knowledge is deemed as being more important than the practical technique and ability.

(2) According to the industry, fire facilities and practices are ranked at the top and air conditioning facility and practices stay at the bottom for those five subjects of the course of architectural facilities at present wherein the demands of the curricular context of the department of architecture in colleges of technology are deemed as being more important than the practical technique and ability.

(3) According to the industry, electric appliance systems and practices are ranked at the top and fire facilities and practices stay at the bottom for those five subjects of the course of architectural facilities at present wherein the practical knowledge is deemed as being more important than the demands of the curricular context of the department of architecture in colleges of technology.

(4) Areas calling for emphasis of the extent of important five years later as predicated by the industry are:

a. Practical technique and ability of the weak electric systems and practices are ranked at the top.

b. Practical technique and ability of the electric appliance systems and practices are ranked at the second place.

c. Practical technique and ability of the air conditioning facilities and practices are ranked at the bottom.

(5) The item of “drainage and water supply systems and practices” is ranked at the top for the

most important item for the extent of demands of the curricular context in the department of architecture of colleges of technology five years later, and the item of “air conditioning facilities and practices”, the least.

B. Recommendations of the Study

Based on the documentation review and the conclusions of the study as described above, recommendations from the study are made as follows:

Whereas 66.6% of those engaged in architecture have the academic background of college or higher, it takes higher educational background to seek a job in the trades related to architecture.

1. For the course of architectural structure, it is recommended that:

(1) Whereas the “application of architectural materials in architectural structure” is the most important subject in the course of architectural structure, it shall be the requirement for all students major in architecture.

(2) When both of the aptitude and competence of a student from the department of architecture are agreeable to the study of structure, he or she may take up the entire course of the structure; and the student after having taken the course of “the application of architectural materials in the architectural structure” has found either the aptitude or the competence fails him or her, the student shall consider a transfer from and stop taking any other subjects offered by the department of structure.

(3) Students from department of civil engineering or irrigation when having found their aptitude and competence appropriate for them to take up the course of architectural structure may take up all the subjects offered in the course of structure with architecture as the second major.

2. For the course of architecture and construction practices, it is recommended that:

(1) Whereas the “QC and QC practices” is the most important subject in the course of architecture and construction practices, it shall be the requirement for all students major in architecture.

(2) When both of the aptitude and competence of a student from the department of architect are agreeable to the study of architecture and construction practices, he or she may take up the entire course of architecture and construction practices; and the student after having taken the course of “QC and QC practices” has found either the aptitude or the competence fails him or her, the student shall consider a transfer from and stop taking any other subjects offered by the department of architecture and construction practices.

(3) Students from department of management, or industrial engineering when having found their aptitude and competence appropriate for them to take up the course of architecture and construction practices may take up all the subjects offered in the course of architecture and construction practices with architecture as the second major.

3. For the course for the architectural management, it is recommended that:

(1) Whereas the “architectural planning, design and business operation” is the most important subject in the course of architectural operation, it shall be the requirement for all students major in architecture.

(2) When both of the aptitude and competence of a student from the department of architect are

agreeable to the study of architectural operation, he or she may take up the entire course of architectural operation; and the student after having taken the course of “architectural planning, design and business operation” has found either the aptitude or the competence fails him or her, the student shall consider a transfer from and stop taking any other subjects offered by the department of architectural operation.

(3) Students from department of land resources, land administration or city administration when having found their aptitude and competence appropriate for them to take up the course of architectural operation may take up all the subjects offered in the course of architectural operation with architecture as the second major.

4. For the course for the architectural design, it is recommended that:

(1) Whereas the “architectural detailed design, materials planning and competence of drawing integration” is the most important subject in the course of architectural design, it shall be the requirement for all students major in architecture.

(2) When both of the aptitude and competence of a student from the department of architect are agreeable to the study of architectural design, he or she may take up the entire course of architectural design; and the student after having taken the course of “architectural detailed design, materials planning and competence of drawing integration” has found either the aptitude or the competence fails him or her, the student shall consider a transfer from and stop taking any other subjects offered by the department of architectural design.

(3) Students from department of industrial design, product design, or interior design when having found their aptitude and competence appropriate for them to take up the course of architectural design may take up all the subjects offered in the course of architectural design with architecture as the second major

5. For the course for the architectural accomplishment, it is recommended that:

(1) Whereas the “cultural accomplishment” is the most important subject in the course of architectural accomplishment, it shall be the requirement for all students major in architecture

(2) When both of the aptitude and competence of a student from the department of architect are agreeable to the study of architectural accomplishment, he or she may take up the entire course of architectural operation; and the student after having taken the course of “cultural accomplishment” has found either the aptitude or the competence fails him or her, the student shall consider a transfer from and stop taking any other subjects offered by the department of architectural accomplishment.

(3) Students from department of management, or industrial engineering when having found their aptitude and competence appropriate for them to take up the course of architectural accomplishment may take up all the subjects offered in the course of architectural accomplishment with architecture as the second major.

6. For the course for the architectural facilities, it is recommended that:

(1) Whereas the “weak electric systems and practices” is the most important subject in the course of architectural facilities, it shall be the requirement for all students major in architecture

(2) When both of the aptitude and competence of a student from the department of architect are agreeable to the study of architectural facilities, he or she may take up the entire course of architectural facilities; and the student after having taken the course of “weak electric systems and practices” has found either the aptitude or the competence fails him or her, the student shall

consider a transfer from and stop taking any other subjects offered by the department of architectural facilities

(3) Students from department of electric engineering, refrigeration or environment when having found their aptitude and competence appropriate for them to take up the course of architectural facilities may take up all the subjects offered in the course of architectural facilities with architecture as the second major.

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Biography:

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Dr. Wang has over twenty years of experience as an architectural designer, engineer, and educator. Currently, he is an Associate Professor of Architecture at the College of Design, National Taipei University of Technology in Taiwan. His major research interests mostly focus on sustainable development of architectural education, human settlement

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