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Comparison on Vocational Engineering Architecture High School Curriculum

(Case study: Shizoukan High School and SMKN 2 Garut)

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***Abstract*—In the process of the education system, Curriculum is one of the most important parts in the study activity. Content in the curriculum is part of the change for the future. In the education period from the beginning of education system when they start to study in elementary school, then junior high school, and go to senior high school until going to the college or working. In this research, we will explain about education curriculum in the field of architecture especially in the Technical High School. The purpose of this research is for the reference for Indonesia curriculum system in Technical High school from the research curriculum system in one of a developed country in Asia: Japan. The subject of this research is SMKN 2 Garut, Indonesia and Shizoukan Technical High School, Japan. So hopefully from this research can know the advantage and disadvantage of both school curriculum systems.**

Keywords— architecture; education; curriculum; high school

I. INTRODUCTION

The Vocational School is one of the factors of education that supports economic and social growth. Development of vocational education is now an important thing to be developed so that students have the skills to plunge into the world of work in the productive age range of 16-64 years, especially in high school. The task of vocational education is the development of a learning system by focusing more on teaching more practice than the theory learning system so that students' skills are more summarized [1]. Even with practical learning, students are expected to be able to apply it to the world of work so that their abilities are more on target. An orientation of vocational school learning patterns must summarize the theory and emphasize student's abilities in practice.

A. Curriculum Making System in Japan

The Ministry of Education, Culture, Sports, Science, and Technology (MEXT), in conjunction with university professors and the Central Council for Education, establishes broad guidelines for the content of each school subject from pre-school education through senior high school. Japanese curriculum also involves an organization that is Architectural Institute of Japan (AIJ). This organization specifically manages architecture in Japan. One way this organization regulates the curriculum is the issuance of entrance tests for expert professional certification. Based on the question, it became the benchmark in making the curriculum both for the high school level and the college level which focused on the field of architectural science.

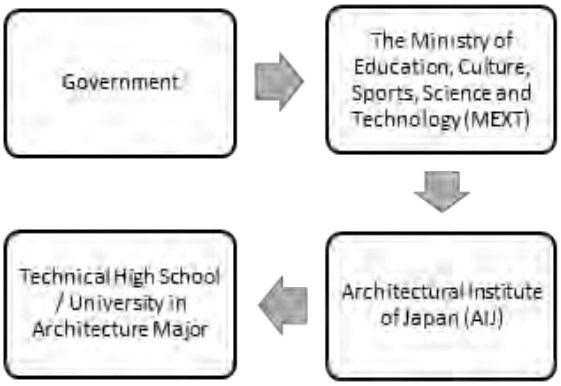

Fig. 1. Curriculum making system in Japan.

B. Curriculum Making System in Indonesia

In the curriculum-making process in Indonesia, the curriculum is under the auspices of the Ministry of Education and Culture of the Republic of Indonesia. The latest system of Vocational School Curriculum (SMK) is the curriculum 2013. Development of this 2013 curriculum from the previous *Kurikulum Tingkat Satuan Pendidikan* (KTSP). In the 2013 curriculum there are 8 (eight) National Education Standards which include content standards, process standards, graduate competency standards, educator standards and education personnel, equipment and infrastructure standards, management standards, financing standards and education assessment standards [2].

Characteristics of the 2013 curriculum, are: developing between spiritual, social, curiosity, creative collaboration with intellectual and psychomotor skills. Based on Article 35 of the Law, it is explained that the competence of graduates is a qualification of graduate competence which includes attitude, knowledge, and skills according to the national standard. Principles of curriculum preparation:

- Refers to the national standard of education to realize the goals of national education
- With the principle of diversification in accordance with educational units, potential areas, and learners
- In accordance with education level within the framework of the Unitary State of the Republic of Indonesia

Fig. 2. Curriculum making system in Indonesia.

II. METHOD

This study uses a comparative qualitative research type. Comparative Qualitative Research is a study whose data is qualitative data so that the analysis is also qualitative (descriptive) analysis. in line with this opinion Sukmadinata (2009; 18) argues that qualitative data is data in the form of words, sentences, and images. This paper uses Survey and Interview methods to collect data.

The reason for choosing Shizoukan Technical High School was because the school was one of the vocational schools in the Japanese Kitakyushu area which had a good study focus as well as several good achievements and educational facilities. Education costs are free by the government. In addition, the location of the Shizoukan technical high school is also accessible from the research location. The reason for choosing SMK 2 Garut is because the school is one of favorite and the oldest vocational high school in Garut. Beside this school is the place of the researcher for learning to be teacher. In this year SMKN 2 Garut has 2 type of curriculum. For class 1 and 2 has a difference from class 3, where class 1 and class 2 architecture class are named DPIB (Modeling and Building Information Design) and grade 3 still uses the KTSP curriculum so it is still named TGB (Technique Building Drawing).

This study will be conducted in the selected schools, including the number of courses and their learning outcomes and credits were examined to know what is the difference between the two schools. . The investigation into architectural curricula. Major from the class I, II, and III. The analysis included elucidating the credit hours of each subject. The data is conducted in the 2013 Curriculum in Indonesia and Curriculum 2017 in Japan.

A. Survey and Interview

The process of taking data with surveys is carried out by researchers and friends who understand the local language. In the survey, especially in Japan the use of language is an important thing that must be done to obtain data. For this reason, the help of local residents and teachers as well as school committees is needed in this process. Researchers list several questions which were then translated into Japanese and then given answers by the school. Researchers are also given the opportunity to tour the school and watch activities in school so that the interview process runs smoothly. The data of SMKN 2 Garut was collected when the second researcher doing PPL (Practice Experience Field). The second Researcher has been interviewed the student and teacher of Architecture Major in SMKN 2 Garut.

1) Description about Shizoukan Technical High School: The school name is Shizoukan Technical High School. The location of the school is in Kyushu island, South of Japan. The school is already 81 years. More than 48000 graduates, active in various fields such as industry, economics, culture, art, etc. This school have 8(eight) departments. There are: Machine Department, Electrical Department, Construction Department, Automobile Department, Information Technology Department, Cookery Department, Art Department, and General Course.. For the Architecture field, they include in Construction Department. Experienced practical raining such as wood processing and drawing, each certificate such as CAD certificate and drawing test. After graduation, the applicant/ student qualifies as an architect, construction management, technician, and construction profiency expert.

2) Description about SMKN 2 Garut: The school name is SMKN 2 Garut (Vocational High School Nation 2 Garut). The history of this school started in 1963. The school name known as School of Medium Technology (STM) Nation Garut. At the beginning STM was accepted 50 student and STM Garut has not any law organization. In 1964 STM Garut has entered Yayasan Pembinaan Pendidikan Teknik (YPPT) and the status of the school is swasta. The school growing bigger from year to year. On 1965 STM Garut officialy become national school. The location of SMKN 2 Garut at Jalan Suherman No.90, Tarogong Kaler, Garut, West Java. There was eight Vocational Program at SMKN 2 Garut.

III. RESULTS AND DISCUSSION

After searching for data from various sources, and surveys and interviews, the following data can be described:

A. Structure Education System in Japan

In the Japanese education process, it has similarities with Indonesia, namely 6 years in elementary school, 3 years in junior high school, 3 years to 5 years in high school / vocational school, and 4 years of tertiary education [3]. In vocational education in Japan is at the Secondary Education level. There are several types of high schools:

- General academic high school
- The Specialized high school that targets future employment in a specific job area (such as agricultural high school, industrial high school, commercial high school, etc.)

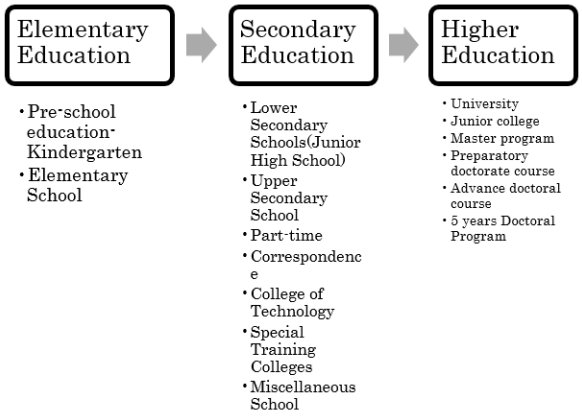

Fig. 3. Structure Education System in Japan.

- Technological colleges (kosen) Combined with college-level education, technological colleges in Japan offer a five-year program to students who wish to gain greater technology-related skills.
- Evening classes/correspondence courses
- Some high schools offer evening classes or home correspondence courses for those who work during the daytime and vice versa, and wish to receive a high school diploma.
- High school graduates are entitled to take admission exams to junior colleges and universities.
- Those who do not hold a high school diploma need to take and pass a qualification test (commonly known as daiken) to be eligible for universities' admission exams.
- Junior colleges offer a two-year program, while universities offer a four-year program. Junior college/technology college graduates may transfer to a four-year university course as a junior student. (Tokyo-icc.jp)

Subject		Department	1	2	3	Total
Common Subject for all Department	Japanese Class	Read Japanese	4			4
		Writing Japanese		2	2	4
	Geography & History	Japan History	2			2
		World History		2		2
	Citizenship	Society			2	2
	Mathematics	Mathematic I	2	2		4
		Mathematic II			2	2
	Science	Science and Human Activities	2			2
		Physical foundation basic		2		2
	Health and Physical Sport	Sport	3	2	2	7
		Health	1	1		2
	Art	Shodo (Draw Kanji)	0		2	2
	Foreign Language	English Communication	2	2		4
		English Expression I				0
	Home	House work Foundation	2			2
		Total	18	13	10	41
Each Subject mainly established in the Department of Specialization	Industrial Building System	Industrial Tech Foundation	2			2
		Themed Research			2	2
		Practical Training(Wood Craft)	2	2	4	8
		Drawing manual/Drafting	2	2	4	8
		Industrial Mathematical Basic	2			2
		Information Technology Fundamental		2		2
		Building structure design		2	2	4
		Building structure		2	2	4
		Building Construction	2	2		4
		Building plan		2		2
		Basic of Environmental Engineering			2	2
		Building Regulation			2	2
		Home room Activity Specialist		2	2	4
Comprehensive Learning Time		Total	10	14	18	42

Fig. 4. Subject of Shizokan Technical HS-Construction Department.

At Shizoukan High School, it is a Technical high school. This school refers to the curriculum set by Architectural Institute of Japan (AIJ) but also adjusts to school conditions. Following data from subjects at Shizoukan Technical High School:

Within the Department of Architecture, there are 15 general subjects that are grouped by type: Language, Geography and History, Citizenship, Mathematics, Science, Health and Physical Sport, Art, Foreign Language (English), and Homework Foundation. Furthermore, there are 13 types of subjects for Architecture majors. The focus on these subjects is more on construction, especially for wood materials where the school has received many awards in this field.

B. Structure Education System in Indonesia

The structure education system in Indonesia took 1-2 year for pre-school education, 6 years for elementary education, 3 years for junior high school, 3-4 years for high school/ vocational high school [4].

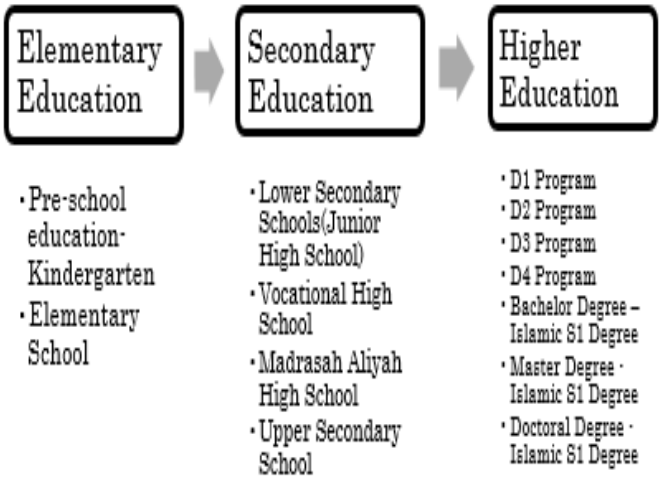

Fig. 5. Structure Education System Indonesia.

Looking at Table 6 about the Curriculum Table of SMKN 2 Garut, they separate the type of subjects into 3 Group. There are A, B, and C. Group A is national content for all class, such as Religion and manner education, Pancasila and civic education, Bahasa Indonesia, mathematic, history, English. Group B is regional content such as art and culture, physical education, sport and health, *Bahasa sunda* and there are counseling. The counseling session take 45 minutes and once in a week. Group C has a vocational content. C1 is basic area such as Digital Simulation, Physic, and Chemistry. C2 is basic skill such as technical drawing, mechanical engineering, and Basic building construction and land surveyor. C3 is skill package, there are building application software and interior design, road and bridge construction, construction estimate cost, construction and utility building, and workshop and entrepreneurship subject [5].

	Subject	Class					
		X		XI		XII	
		1	2	1	2	1	2
A National Content							
1	Religion and Manner Education	3	3	3	3	-	-
2	Pancasila and Civic Education	2	2	2	2	-	-
3	Bahasa Indonesia	4	4	4	4	-	-
4	Mathematics	4	4	4	4	-	-
5	History of Indonesia	2	2	2	2	-	-
6	English	2	2	2	2	-	-
B Regional Content							
1	Art and Culture	2	2	2	2	-	-
2	Phisycal Education, Sport & Health	3	3	3	3	-	-
3	Bahasa Sunda	-	-	2	2	-	-
4	Counseling	1	1	1	1	-	-
C Vocational							
C1 Basic Area of Expertise							
1	Digital Simulation	3	3	-	-	-	-
2	Physisc	3	3	-	-	-	-
3	Chemistry	3	3	-	-	-	-
C2 Basic Skill Program							
1	Technical Drawing	3	3	-	-	-	-
2	Mechanical Engineering	3	3	-	-	-	-
3	Basic Building Construction and Land Surveyor	7	7	-	-	-	-
C3 Skill Package							
1	Building Application Software and Interior Design	-	-	9	9	-	-
2	Road and Bridge Construction	-	-	5	5	-	-
3	Construction Estimate Cost	-	-	4	4	-	-
4	Construction and Utility Building	-	-	6	6	-	-
5	Workshop and Entrepreneurship	-	-	5	5	-	-

Fig. 6. Subject of Architecture Department Indonesia.

IV. CONCLUSION

Based on the data collection and analyzed, it is known from the start that there are some differences between the two schools due to the culture, policies and lifestyle of each country. But it can be purified that there are still similarities between the two because they had relations in World War II that affected the education system from Japan to Indonesia. Among them, education has the right to be enjoyed by all levels of society, as well as the year of education with a 6-3-3 pattern. Especially in the subjects of architecture, here are the results of an analysis diagram of differences, similarities, and similarities in the subjects of the two schools:

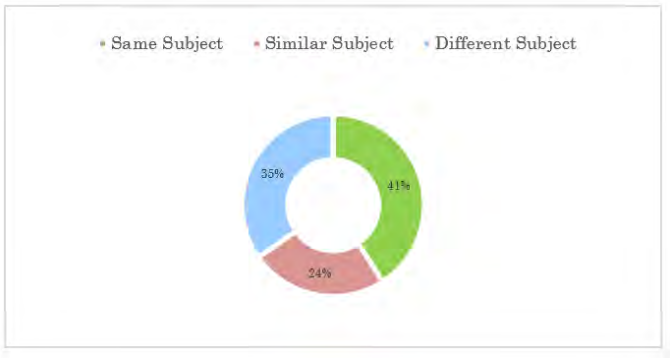

Fig. 7. Diagram analysis subjects.

Therefore, it is significant to certain criteria to review and update the quality of the architecture curriculum. The different subject is Geography, House work Foundation, Foundation-Family, Basic subject about Industry, Themed research (zemi), Building Planning (Landscape), building regulation, and home room activity.

For example in SMK 5 Bandung curriculum, they have religion subject because Indonesia is the most majority of Muslims, so they put religion as the subject. Workshop and entrepreneurship also in the curriculum because the government rules that want to produce more entrepreneur for the future so SMK is not just product employee.

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