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Comparison Research on the Characteristics of Architectural Plans per Change in Administrative Clients of Newly-Established Elementary Schools in Sejong City, Korea

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Abstract
Sejong City in Korea is supposed to establish 150 elementary schools, middle schools and high schools as a multifunctional administrative city to which central administration agencies and affiliated institutions are relocated for the purpose of resolution to the overconcentration of the capital area, balanced development of the nation and enhancement of national competitiveness by 2030, and as of 2015, 58 schools have been opened.Since its inauguration, Sejong City has constructed about 60 schools going through unprecedented qualitative improvement as well as quantitative expansion in a short period of time. At the earlier stage, the project of establishment of the schools was MACC (Multifunctional Administrative City Construction Agency in Sejong City) before changing into Sejong City Office of Education. Accordingly, various attempts were proactively made to introduce creative spatial concepts to construction of schools in various ways based on public invitation of design, BTL (Build-Transfer-Lease) and collaboration with experts in school facilities so that they could be reflected. Against this backdrop, the study was focused on figuring out architectural characteristics and conducting relative comparison in consideration of changes in subjects to planned school construction projects and methods of placing construction building placement orders in Sejong City, which led elementary schools in Sejong City to experimentally introduce diversified arrangements, various architectural types and new concepts of school spaces, and it eventually helped suggest alternatives to school spaces responding to changing methods of teaching and learning that includes smart education.

Keywords: Sejong City Korea, Elementary School, Administrative Clients, Site Plan Type, and Space Organization

Introduction

1. Background and Objective of Research

Korea's Sejong City is a newly constructed city in the Yeongi-gun and Gongju areas of Chungcheongnam-do which is a multifunctional administrative city in which the central administrative institutions and affiliated institutions moved to for the objective of resolving overpopulation of the capital, developing the nation in balance and reinforcing national competitiveness.The 'Proclamation of the Special Act on Establishment of Sejong City' was legislated in March 18th, 2005 and construction of the multifunctional administrative city began in full-scale in 2007 and finished its 3-step relocation of its central departments and national research and development institutes by December, 2014.As a self-sufficient multifunctional administrative city, Sejong city is being constructed step-by-step since 2007 with a goal to build a new city with a population of 500, 000 by 2030. The population of Sejong city exceeded 160, 000 in late January, 2015.

Accordingly, Sejong city need to establish 150 schools (66 kindergarten, 41 elementary schools, 21 middle schools, 20 high schools, special schools 2) as residents start moving into the first apartments of the first town in December 2011. At present, in 2015, 58 schools (22 kindergarten, 17 elementary schools, 9 middle schools, 8 high schools, 2 special schools) have been established.Until Sejong City Hall and Education Office was founded in July 1st, 2012 and work on educational facilities began, MACC(Multifunctional Administrative City Construction Agency) was in charge of work regarding the establishment of educational facilities and changing administrative clients of that of newly-established schools of Sejong City.Afterwards, creative planning concepts have been actively implemented and reflected in the construction of schools using various methods like basic research on plans through competition, BTL(Build-Transfer-Lease), and participation of experts in school facilities.

Thus, this research aims to provide basic data and search for directions of the construction plan that can help elementary schools in the future by understanding and comparing the characteristics according to the administrative client and ordering method of planned elementary schools of Sejong City, which is going through both an unprecedented qualitative and quantitative expansion in a short period of time, referring to the innovative change in educational environment using trial demonstrations of a smart education and building 58 schools in three years.

2. Scope and Method of Research

For this research, 17 newly established elementary schools from 2012 to 2015 within Sejong City were classified according to the characteristics on a yearly basis, ordering method, and the change in administrative clients. An objective comparison was made per administrative client and four

elementary schools with similar size of class were chosen and a total of 12 schools were analyzed as a subject of research in three steps.

As a method of research, the arrangement type that is the most basic factor that decides the characteristics and structure of elementary schools, was first analyzed to understand the overall characteristics of school facilities. The space program, unit learning space, floor planning and zoning will be analyzed for understanding the characteristic of the elementary school's space organization according to administrative clients.

Curriculum of Elementary Schools

1. Revised Curriculum of Elementary Schools 2009

The Ministry of Education in Korea revised the curriculum of elementary schools in 2009 to promptly meet the demand of the times since the current curriculum holds a limit in fostering creative talented individuals that the future society asks for and to realize a creative school education for a 'fun school-study what I want to study' education. This pursues a change in education by [1] decreasing the burden on students, [2] inducing learning interest in students, [3] developing learning skills instead of an education for fractional knowledge and understanding, [4] develop a thought provoking and dissuasive atmosphere in order to build a more individualistic character to help foster the growth of said talented students instead of emphasizing excessively on memorization.

The main contents of the revised curriculum are as follows:

[1] The total number of courses taken per semester is to be reduced and the efficiency of learning was reconsidered by selecting a 'grade group' and 'course group'. This was to grant flexibility by mutual cooperation and collaboration among grades, and to flexibly organize and manage the curriculum according to the career path and aptitude of the student.

[2] 'Voluntary increase in class hours within 20% per course (group)' considering area, school, characteristic of students is allowed so that a customized management of the curriculum reflecting variety is possible.

[3] By complementing the problem from discretionary activities of the revised curriculum of 2007, 'Creative Activity for Experience' was newly made so that creative talents can be fostered to care and give to others.

[4] Schools voluntarily implemented an 'Intensive Course System' and reduced the number of courses per semester and reduced the educational burden on students in order to give them a meaningful educational experience.

2. Educational Policy of Sejong City

2.1 Educational Vision of Sejong City

[1] In order to make a happy and safe school,-meaning a school without school violence,-bullying in groups and the corresponding corporal punishment, education for creativity and character is carried out and the establishment of a liaison among school, home, and local society is being carried forward. The number of students per class is maintained as 20-25 people and the interaction between student and teacher is enhanced. The spaces for uniform general classrooms are made into a learning environment with classrooms and spaces of various sizes to manage a curriculum for creativity and character.

[2] A learning environment using IT technology has been set up to enhance the variety and quality of the courses along with the construction of infrastructure within schools, through connections with external learning sources such as museums (cultural/ science) to build up an enhanced education system.

[3] To accompany the development of both school and students of the city and rural areas, local strategic schools that manage education programs specializing around rural areas are being promoted. Through the complex city and rural education environment in which high-tech education and rural education coexist, continuous bilateral exchange between cities and rural areas are being pushed forward.

2.2 Smart Education of Sejong City

A smart education is an education that uses various mobile learning materials within the Internet environment regardless of time and place; it is an education method, which focuses on the learning activity through the cooperation of members such as self-directed creative activity and group learning.

Since 2012, Sejong City has continuously set up a smart school environment in which smart pads, electronic boards, Role-play learning rooms (VR Rooms), and other various emotional/experimental spaces.

Table 1: Direction of Policy for Smart Education in Sejong City

Smart Education 1.0 (2012~2013)	a) Establishment of smart schools and environment
Smart Education 2.0 (2013~2014)	a) Completion of smart education infrastructure establishment. Ex.Supply 1 smart pad per student over 4th year student. b) Utilization and completion of "Smart-I" establishment that is a platform of content distribution on the basis of teaching and learning.
Smart Education 3.0 (2015~)	a) Suggestion of smart education models classified by areas and schools b) Development of teacher's ability, who is the main agent of the smart education based class.

A smart school goes beyond the limited classroom and connects to the outside world. By supporting the search and

use of useful data for the course, changes have been made to expand the learning space, so that learning activities can continue outside of the classroom. Based on such experience, developments are underway for a new school look such as teaching/learning model for smart learning, connections with special environment, and researches on the special components of smart classrooms and a strong will to act as a strategic point for smart education is displayed.

Space Organization of Elementary Schools in Sejong City

1. Current Status and Classification of Elementary Schools in Sejong City

Considering the change in ordering method and the characteristics of the architectural plan, Sejong City's elementary schools can be divided in to three parts: the initial stage in which establishment works for school facilities were carried out by the MACC, the middle stage which was a transitional phases in which Sejong City Hall and Sejong City Office of Education was founded and works on educational facilities were transferred, and the latter stage where Sejong City Office of Education supervised the establishment works of school facilities.

Table 2: Current Situation of ElementarySchool in Sejong City

Clients	Opening Date	School Name	Class	Ordering Method
MACC (Schematic Design + Working Drawing)	2012.03	Charmsaem	30	Competition
	2012.09	Hansol	36	
	2013.03	Dodam	42	BTL
	2013.03	Yeonse	24	
MACC (SchematicDesign) + Office of Education (Working Drawing)	2014.03	Yeonyang	48	PQ Bidding
	2014.03	Areum	42	
	2014.03	Mireu	30	
	2014.09	Nara	48	
	2014.09	Yangji	42	
Office of Education (Schematic Design + Working Drawing)	2015.03	Duru	36	PQ Bidding
	2015.09	Garak	36	
	2015.03	Eutteum	24	
	2015.03	Gowoon	48	
	2015.03	Onbit	42	
	2015.03	Jongchon	42	
	2015.03	Neulbom	42	
	2015.03	Dabit	48	

[1] MACC (Schematic Design+Working Drawing): Competition / BTL

The first was a period when school design was completed through competition and BTL (Build-Transfer-Lease) under the MACC temporarily before the establishment of Sejong City Hall and Sejong City Office of Education according to the 'Proclamation of the Special Act on Establishment of a New Administrative Capital'. Charmasem Elementary School and Hansol Elementary School which were established to meet the first moving in date for the first town in Sejong City in 2012, Dodam Elementary School and Yeonse Elementary School which were constructed in the demonstrative neighborhood in the area behind government buildings.

[2] MACC(SchematicDesign)+Office of Education(Working Drawing): PQ Bidding

The next is a transitional phase in which the schematic design was done by MACC and Sejong City Office of Education supervises only the working drawing and construction after supervision is transferred to Sejong City Office of Education in 2012. Yeonyang Elementary School, Areum Elementary School, Mireu Elementary School and Yangji Elementary School apply to this case.

When the work was transferred to Sejong City Office of Education at the construction phase after the schematic design was completed, it is judged that this was insufficient to reflect the demands of Sejong City Office of Education and the regional characteristics. Also, due to the sudden inflow of population which exceeded the predicted demand, horizontal and vertical extension of the number of classes were made through changes in the working drawing during construction, leading to a strange phenomenon of more-than-planned number of classes.

[3] Office of Education (Schematic Design+Working Drawing): PQ Bidding

Recent phases are periods when school designs are completed with schematic designs from school facilities experts as its basis in selected design offices through PQ (Pre-Qualification) bidding by Sejong City Office of Education. This applies to seven schools other than Duru Elementary School which was founded in March, 2015.

It is thought that the school plan was made with relatively high degree of completion through the multiple consulting sessions, architectural review of the Construction Agency of Sejong City and scenery / architectural color reviews.

Table 3: Architecture Scheme of Research Object Elementary School

Clients	School Name	Class (Number)	Site Area	Gross Area	Building Scope
MACC	Charmsaem	30 (750)	10, 665 m^2	11, 162 m^2	B1 / 4F
	Hansol	36 (900)	11, 425 m^2	7, 721 m^2	5F
	Dodam	42 (1, 050)	18, 362 m^2	7, 963 m^2	B1 / 3F
	Yeonse	24 (600)	17, 576 m^2	8, 041 m^2	B1 / 3F
MACC + Office of Education	Yeonyang	48 (1, 200)	16, 233 m^2	11, 783 m^2	B1 / 4F
	Areum	42 (1, 050)	13, 868 m^2	9, 023 m^2	B1 / 5F

	Mireu	30 (750)	13, 037 m^2	14, 939 m^2	B1 / 4F
	Yangji	42 (1, 050)	14, 963 m^2	13, 828 m^2	5F
Office of Education	Duru	36 (900)	14, 822 m^2	17, 908 m^2	B1 / 4F
	Eutteum	24 (600)	14, 606 m^2	11, 608 m^2	B1 / 4F
	Onbit	42 (1, 050)	14, 992 m^2	17, 260 m^2	B1 / 4F
	Jongchon	42 (1, 050)	14, 670 m^2	19, 503 m^2	B1 / 5F

2. Analysis on Site Planning

2.1 Analysis on Site Are and Exterior Space

Of the elementary schools that the 'MACC' ordered, Charmsaem Elementary School and Hansol Elementary School which were established in the first town secures the smallest site area of the elementary schools in Sejong City. On the contrary, Dodam Elementary School and Yonse Elementary School secures the largest site area.

As a result, a strange phenomenon of Charmasem Elementary School of 30 classes and 750 people securing 6, 911m^2 more site area than Yonse Elementary School of 24 classes and 600 people erroneously occurred.

Elementary schools that were ordered by the 'MACC + Office of Education' had a relatively even spread of area ratio per student, but due to the increase in the number of classes compared to the forecasted demand, the schools hold the smallest site area and schoolyard area per student among the elementary schools in Sejong City. Elementary schools that were ordered by the 'Office of Education' had a uniform area of about 14, 000 m^2 regardless of the number of classes.

This is thought to be true since a systematic securement of area is not being made since the school area of Sejong City is being built upon within a pre-designated location and area according to city planning.

Table 4: Site Area and Schoolyard Area per Student

Clients	School Name	Site Area per Student	Schoolyard Size	Schoolyard Area	
				All	per Student
MACC	Charmsaem	14.22 m^2	32m x 51m	1, 632 m^2	2.18 m^2
	Hansol	12.69 m^2	31m x 44m	924 m^2	1.52 m^2
	Dodam	17.49 m^2	40m x 70m	2, 800 m^2	2.67 m^2
	Yeonse	29.29 m^2	39m x 60m	2, 340 m^2	3.90 m^2
Average		18.42 m^2	36m x 56m	1, 924 m^2	2.57 m^2
MACC + Office of Education	Yeonyang	13.53 m^2	39m x 62m	2, 418 m^2	2.02 m^2
	Areum	13.21 m^2	35m x 65m	2, 275 m^2	2.17 m^2
	Mireu	17.38 m^2	32m x 51m	1, 632 m^2	2.18 m^2
	Yangji	14.25 m^2	35m x 61m	2, 135 m^2	2.03 m^2
Average		14.59 m^2	36m x 60m	2, 115 m^2	2.10 m^2
Office of Education	Duru	16.47 m^2	36m x 58m	2, 088 m^2	2.32 m^2
	Eutteum	24.34 m^2	39m x 59m	2, 301 m^2	3.84 m^2
	Onbit	14.28 m^2	38m x 60m	2, 280 m^2	2.17 m^2
	Jongchon	13.97 m^2	40m x 65m	2, 600 m^2	2.48 m^2
Average		17.27 m^2	38m x 61m	2, 371 m^2	2.70 m^2

Like the situation of the site area mentioned previously, schoolyard and exterior space which is closely related to the

school area for schools ordered by the 'MACC' secures the smallest/largest schoolyard area.

The reason that elementary schools ordered by the 'MACC+Office of Education' hold larger schoolyard areas than elementary schools ordered by the 'Office of Education' is considered to be because they were planned by Sejong City Office of Education that understands best the characteristics of elementary schools in which the importance of exterior space among educational facilities is most emphasized.

2.2 Analysis on Site Plan Type

In school construction, the site plan is the most basic element that decides the characteristic and structure of the learning space, and thus directly affects the lives of students such as in exterior space, channel of movement and living space according to the site plan type.

Table 5: Layout Patterns of Research Object Elementary Schools

School Name	MACC			
	Charmsaem	Hansol	Dodam	Yeonse
Layout Pattern	'—' shape	'ㄷ' shape	'ㄷ' shape	'ㄷ' shape
School Name	MACC+Office ofEducation			
	Yeonyang	Areum	Mireu	Yangji
Layout Pattern	'ㅁ' shape	'ㄷ+—' shape	'—' shape	'ㄱ+—' shape
School Name	Office ofEducation			
	Duru	Eutteum	Onbit	Jongchon
Layout Pattern	'ㄷ' shape	'ㄷ' shape	'ㄱ+—' shape	'T' shape

[1] MACC (Schematic Design+Working Drawing)

Elementary schools ordered by the 'MACC' mainly has plans to arrange school buildings in a 'ㄷ' shape. Such plan has its merits in that it can separate lower grades from upper grades and it can be easily accessed by arranging a special classroom building in the center of the entire building.

However, 'ㄷ' shaped schools can nearly give a simple arrangement format but this is thought to be a uniform arrangement due to the then-existent BTL method.

[2] MACC (Schematic Design)+Office of Education (Working Drawing)

Elementary schools ordered by the 'MACC + Office of Education' display various site plan types in 'ㅁ' shape, 'ㄷ+—' shape, '—' shape and 'ㄱ+—' shape in order to break away from such a simple arrangement type and try to change by dealing with the mass of the building in a curve. However, due to the excessive use of curves, problems occurred due to the lack of expense and time for construction, and it became the object of controversy due to the inefficient use of internal space.

[3] Office of Education (Schematic Design+Working Drawing)

In order to make improvements to these problems, elementary schools ordered by the 'Office of Education' is now planning in 'ㄷ'shape, 'ㄱ+—' shape which is a modification of 'ㄷ'shape or 'T' shape to complement the disadvantages of previous elementary schools. And in the case of Onbit Elementary School, a rooftop garden in the lower level and an inner courtyard has been implemented to set up various exterior spaces.

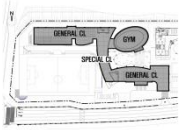
Clients	Charmsaem	Hansol	Dodam	Yeonse
MACC				
				
Clients	Yeonyang	Areum	Mireu	Yangji
MACC + Office of Education				
				
Clients	Duru	Eutteum	Onbit	Jongchon

Figure 1: Arrangement Situation of Research Object Elementary Schools

3. Analysis on Space Program

Differences of 4.48% in teaching & learning area, 3.58% in support area are shown depending on the change of each administrative client. This is a phenomenon that appears due to the gradual increase in the ratio of support areas such as learning support space and convenience facilities.

Also, elementary schools constructed in Sejong City have a common ratio of 56~57% in net area and 42~43% in common area.

Especially, the fact that the ratio of the common area is more than 40% means that, a hallway which exceeds a minimum of 3.0m for student's easy access, sufficient learning support space such as media space, and a specialized area that reflects each elementary school's characteristics has been put in place.

Table6: Space Program of Research Object Elementary Schools (%)

Clients	School Name	T&L	SU	MA	Net Area	Common Area
MACC	Charmsaem	23.40	22.26	5.01	50.67	49.33
	Hansol	36.33	14.37	5.50	56.20	43.80
	Dodam	27.29	26.05	8.76	62.10	37.90
	Yeonse	27.03	19.39	9.02	55.43	44.57
Average		28.51	20.52	7.07	56.10	43.90
MACC + Office of Education	Yeonyang	29.32	20.56	7.09	56.97	43.03
	Areum	34.56	15.72	9.20	59.48	40.52
	Mireu	26.84	21.75	7.59	56.18	43.82
	Yangji	33.68	17.13	7.19	58.00	42.00
Average		31.10	18.79	7.77	57.66	42.34
Office of Education	Duru	26.15	21.58	10.17	57.90	42.10
	Eutteum	24.42	24.67	9.90	59.00	41.00
	Onbit	27.74	22.02	6.18	55.94	44.06
	Jongchon	28.16	21.07	6.51	55.74	44.26
Average		26.62	22.34	8.19	57.15	42.86

※ T&L = Teaching & Learning Area, SU = Support Area, MA = Managing Administrative Area

4. Analysis on Space Organization

4.1 Analysis on Unit Learning Space

The general classroom is a place for students' teaching & learning and is also a living space at the same time which serves as the center of all the educational activities of the school. A securement of an area of $1.8m^2$~$2.1m^2$ per student is optimal and elementary schools of Sejong City has 25 students per class and secures $2.2m^2$ of an area per student.

Elementary schools ordered by the 'MACC' or the 'MACC + Office of Education' do not have uniform size of classrooms, but schools ordered by the 'Office of Education' uniformly makes it so that the size of the classrooms are 8.4m x 7.2m.Such standardization of classroom width seems to be in consideration of the student's visible range of the screen that is in response to the number of smart education and learning methods incorporated with using beam projectors.

Table7: Class Room Module & Unit Area of Research Object Elementary Schools

Clients	School Name	Module (m)		Unit Area (m^2)	
		Width	Depth	All	per Student
MACC	Charmsaem	8.1	7.5	60.75	2.43
	Hansol	8.1	7.5	60.75	2.43
	Dodam	8.1	6.9	55.89	2.24
	Yeonse	7.8	7.2	56.16	2.25
Average		8.0	7.3	58.39	2.34
MACC + Office of Education	Yeonyang	8.1	6.9	55.89	2.24
	Areum	8.1	7.8	63.18	2.53
	Mireu	8.1	7.5	60.75	2.43
	Yangji	8.1	6.9	55.89	2.24
Average		8.1	7.3	58.93	2.36
Office of Education	Duru	8.4	7.2	60.48	2.42
	Eutteum	8.4	7.2	60.48	2.42
	Onbit	8.4	7.2	60.48	2.42
	Jongchon	8.4	7.2	60.48	2.42
Average		8.4	7.2	60.48	2.42

4.2 Analysis on Floor Planning

[1] MACC (Schematic Design+Working Drawing)

The Ministry of Education has selected Charmsaem Elementary School, which has been ordered by the 'MACC', as a school with excellent facility in 2012. There is a corridor with a width of 11m / media space hall in the center of the middle corridor space which comprises of general and special classrooms and in connection of the Play Space with the media space hall which is for presentations, exhibits, and performances, various learning, resting and socializing spaces are planned, proposing a new differentiated concept for school space.

However, due to the construction of a middle corridor form, there is a problem with the lighting and ventilation in the huge space in the middle.

Hansol, Dodam and Yonse Elementary School arranged special classrooms between lower and upper grades in order to make movement easy for students allowing for an efficient channel of movement.

Especially, Dodam and Yonse Elementary School dispersedly arranged administrative and managerial areas on the first and second floor, and intensively arranged classrooms for lower grades on the first floor so that lower grade students can safely and easily access their classrooms. The courtyard was planned to be an exterior space for the use of lower grades only.

[2] MACC (Schematic Design)+Office of Education (Working Drawing)

The drastic curves of elementary schools ordered by the 'MACC + Office of Education' are used as elements that comprise exterior volume but it is told that this brings low efficiency in internal space.

However, increased utilization of internal and external space using a connecting bridge or pilotis even though following the basic composition of arranging special classrooms in the middle or increased open space compared to previous schools is understood as an enthusiastic expression of the willingness to make an improvement for better school facilities.

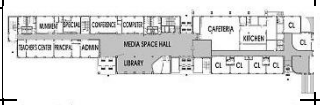
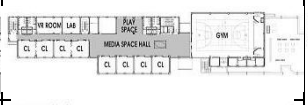
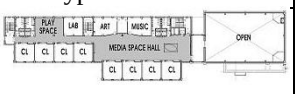
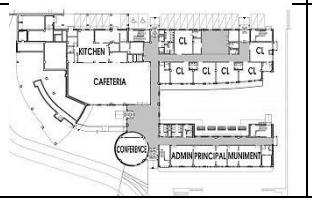
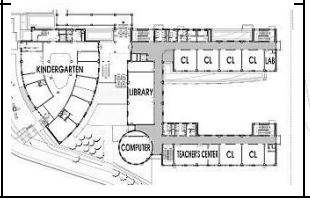
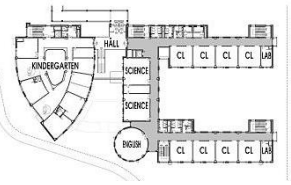
[3] Office of Education (Schematic Design+Working Drawing)

Elementary schools ordered by the 'Office of Education' are more actively implementing the planned space organization of the 'MACC' and the pilotis space and the open space shown in the 'MACC + Office of Education'.

Also, as administrative clients change as in [Table 8], gradually classrooms for the use of course only, for discretion, and for other various learning and living space support spaces are additionally being planned.

Table8: AdditoryOrganization Element of Reaearch Object Elementary Schools

Clients	School Name	Open Space	Media Space	Creative Personality Space	Multimedia Room	English Experience Room
MACC	Charmsaem	●	○	●	●	△
	Hansol	△	△	△	△	△
	Dodam	△	●	△	△	△
	Yeonse	●	●	△	△	△
MACC + Office of Education	Yeonyang	●	●	△	△	●
	Areum	●	△	●	△	●
	Mireu	●	○	●	△	●
	Yangji	△	●	△	△	●
Office of Education	Duru	●	●	△	○	●
	Eutteum	●	●	●	●	●
	Onbit	●	●	●	●	●
	Jongchon	●	○	○	●	●
Clients	School Name	Optional Subject Room	Club Room	Childcare Room	Health Education Room	Counseling Room
MACC	Charmsaem	△	△	△	△	●
	Hansol	△	△	△	△	△
	Dodam	△	●	△	△	●
	Yeonse	●	●	△	△	●
MACC + Office of Education	Yeonyang	●	●	△	●	●
	Areum	●	●	△	●	●
	Mireu	△	△	△	●	●
	Yangji	●	●	△	●	●
Office of Education	Duru	●	●	●	●	●
	Eutteum	●	●	●	●	●
	Onbit	●	●	●	●	●
	Jongchon	●	△	●	●	●
●: Clear Organization ○: Unclear Organization△: Not Found						

1. Clients : MACC			
School Name	1st Floor Plan	2nd Floor Plan	Typical Floor Plan
Charmsaem			
Hansol			

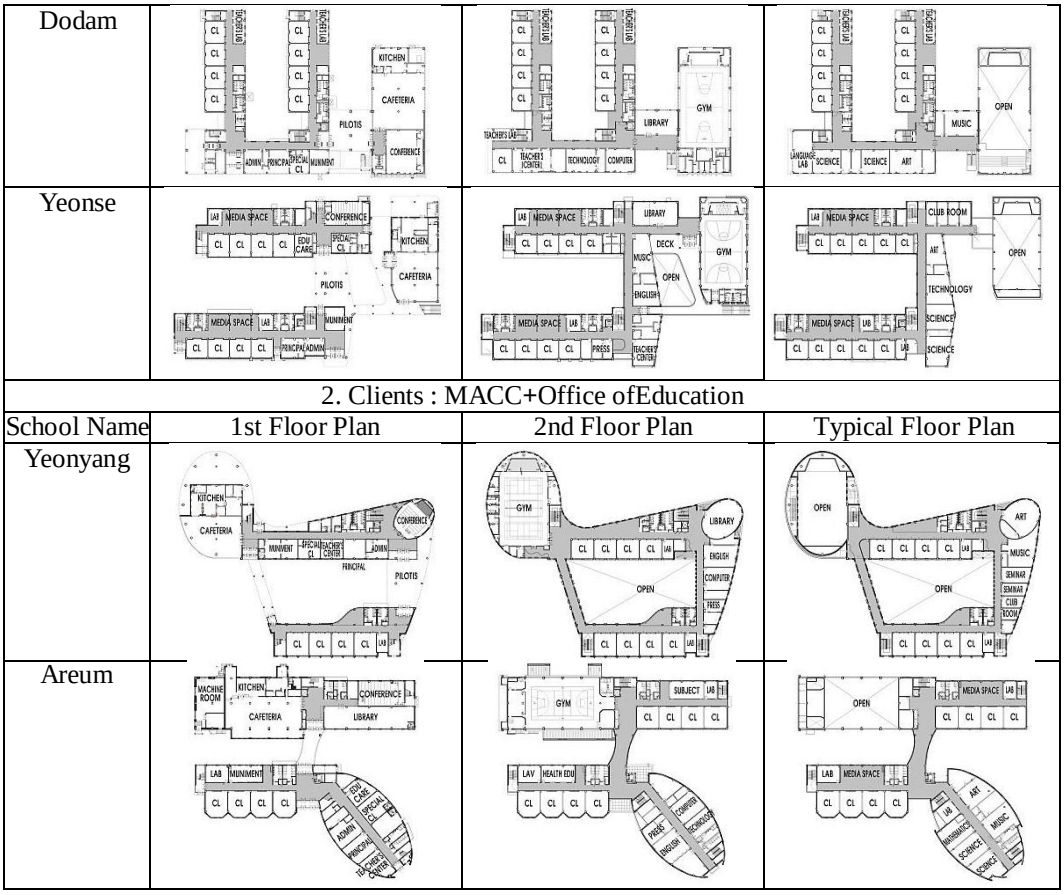
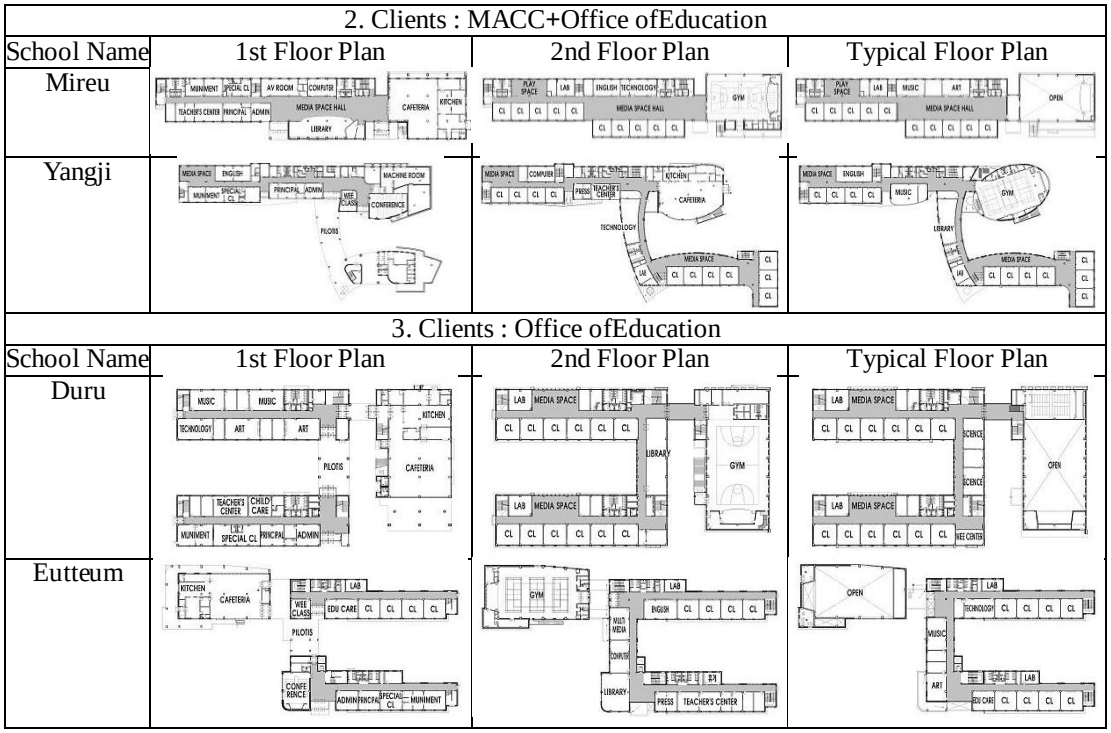


Figure 2: Floor Plan of Research Object Elementary Schools-1



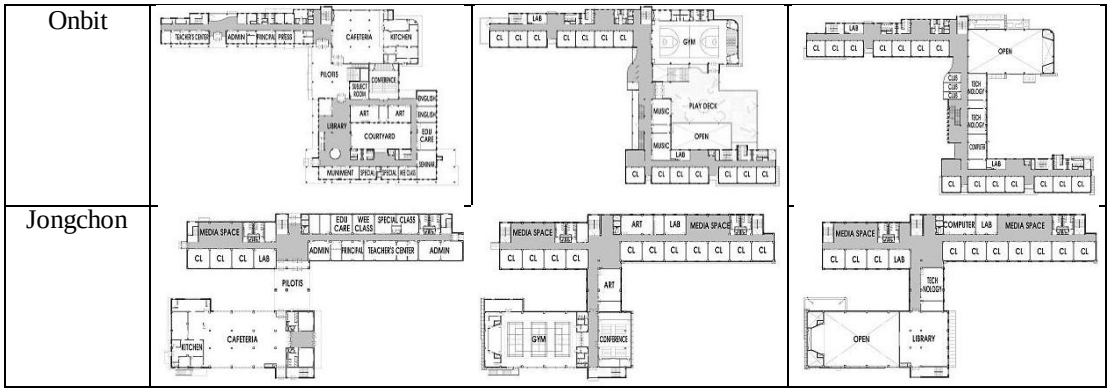


Figure 3: Floor Plan of Research Object Elementary Schools-2

4.3 Analysis on Zoning per Level

Zoning per level in elementary schools of Sejong City is as in [Figure 4] and the library is arranged on the first and second floor where usage and socialization of students occurs the most. The first floor which used to be occupied by administrative/managerial space that functioned to maintain and manage the school is gradually being changed into a space for students and elementary schools ordered by the 'Office of Education' has its art room and music room planned in the lower floors.

Breaking away from educational activities centered on the knowledge of school subjects, this is understood to be a phenomenon dealing with an educational method which emphasizes activities for experience that can cultivate character, emotion and creativity in students. It is thought that educational space for music, art and physical education along with the library is in the process of gradually becoming the center of school facilities.

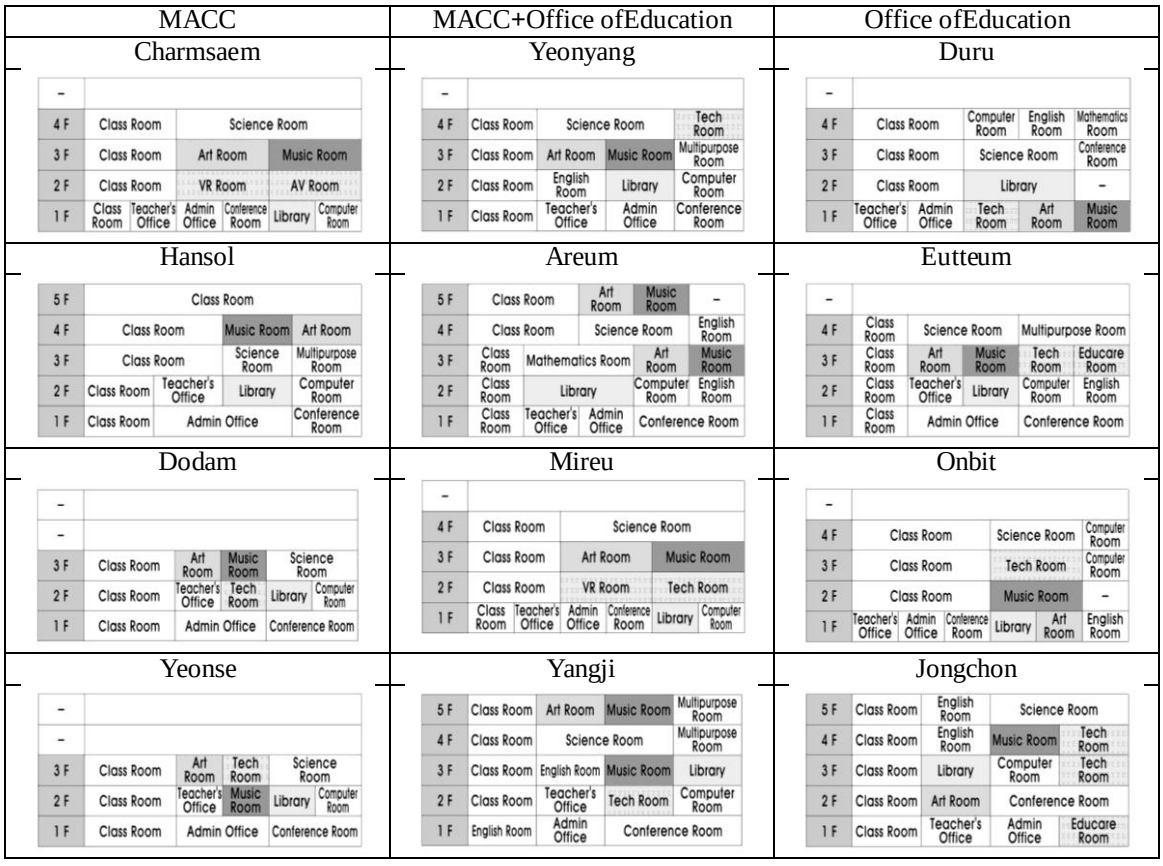


Figure 4: Zoning of Research Object Elementary Schools

Conclusion

This research classified the elementary school of Sejong City based on the change in administrative clients to understand the architectural characteristics of the schools and analyzed in comparison based on site area, exterior space, arrangement type, space program, unit of learning space, floor planning and zoning per floor. We came up with the following conclusion.

[1] MACC (Schematic Design+Working Drawing): Competition / BTL

Due to limited site area, sufficient securement of schoolyard and external space was not made possible but by arranging the school building in a '⊏' shape, internal/external space was used efficiently. With an average of 43.90% ratio of common area, easy movement of students and characteristics per school were considered. An alternative was proposed on new school space like Charmsaem Elementary School.

[2]MACC(Schematic Design)+Office of Education(Working Drawing): PQ Bidding

Changes have been attempted through various forms of site plan type compared to previous schools and the treatment of the building's mass with curves. The efficiency of internal space was low due to this.

However, using connections bridges increased the use of internal/external space and pilotis compared to other schools and it seems that open space increased.

[3] Office of Education (Schematic Design+Working Drawing): PQ Bidding

Through multiple consulting sessions, architectural review and scenery/architectural color review, a comparatively complete school construction plan was established.

Comparatively, the site area and schoolyard area per student is the largest. With previous phases of school planning proposal as its foothold, a more diverse site plan and space organization is being made. Class size, open space and learning support space have actively been planned in consideration of smart education and libraries, music rooms and art rooms are moving to lower levels.

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