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Exploring Parents' Needs for Campus Architectural Planning from the Kano Two-Dimensional Quality Model - Taking Metropolitan Elementary Schools as an Example

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Abstract

The current design of campus buildings often originates from subjective considerations of architects, lacking in-depth exploration of user needs. This study utilizes the Kano two-dimensional quality model (Kano Model) to identify the quality attributes of school building from the perspective of users. These findings can serve as crucial references for future school construction designs.
The sample for this study is taken from a metropolitan Type A school in the northern region, with parent feedback obtained through a questionnaire survey. It is recommended for future research to expand the sample size by including groups from different regions to obtain a more comprehensive understanding for the planning and design of campus buildings.

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1. Introduction

School architecture is different from other buildings in its connotations and the essence of education. When a school building is completed, it not only serves as a place to practice education, but is also expected to become a silent facilitator of educational practice. (Wu, 2018).

Traditional school buildings were all planned by architects and then discussed, architect-oriented, lacking large-scale participation by parents, neighboring communities in the design. Taking a certain metropolitan school in the north as a case study (School A), it is expected to carry out the planning of the architectural volume. Therefore, it is intended to explore the important needs for campus architectural planning by integrating the DQI and Kano two-dimensional quality model methods.

2. Literature Review

2.1 Exploration of Campus Architecture and Design Quality Indicators for Architectural Engineering

Buildings must be conducive to the practice of the educational process, improve the quality of the learning environment, and create schools that meet future needs and expectations.

The school buildings built today will still exist in fifty years. As the carrier of education, not only must the building structure have the strength of fifty years, but the campus space facilities must also be able to adapt to the future social development and possible reforms to ensure that education can keep up with at least fifty years of educational inheritance and reform in the future (Wu, 2018).

By using the Design Quality Indicator (DQI) for architectural engineering, we can find out the requirements that meet the planning needs and determine what good architectural design quality is. In 1999, the UK Construction Industry Association proposed a set of methods to measure architectural engineering design quality, the Design Quality Indicator (DQI) model (Gann et al, 2003). The three aspects of DQI (Markus, 2003), based on the three major design aspects of DQI, indicators for examining design quality have been developed, with a total of ten indicator items.

(1) Functionality aspect, there are 3 indicators under the functionality aspect.
Use - 7 items total
Access - 7 items total
Space - 6 items total

(2) Building Quality aspect, there are 3 indicators under the building quality aspect.
Performance - 10 items total
Engineering - 8 items total
Construction - 7 items total

(3) Impact aspect, there are 4 indicators under the impact aspect.
Urban and social integration - 6 items total
Internal environment - 8 items total
Form and Materials - 5 items total
Character and Innovation - 6 items total

2.2 Kano Two-Dimensional Quality Model

An important theory on product design and product quality. The five major attribute categories of the Kano two-dimensional quality model are defined and described as follows (Lu, 2016):

(1) One-Dimensional Quality [O]: The higher the degree of this type of quality content, the more satisfied the user is.
(2) Must-Be Quality [M]: When this type of quality content is provided, the user will not feel satisfied, but if it is not provided, it will cause the user to be extremely dissatisfied.
(3) Attractive Quality [A]: Providing this type of quality content will make the user feel very satisfied; without it, the user doesn't care or barely accepts it, and will not feel dissatisfied.
(4) Indifferent Quality [I]: Whether or not this type of quality content is provided does not lead to user satisfaction or dissatisfaction.
(5) Reverse Quality [R]: Providing this type of quality content will lead to user dissatisfaction, while not providing it will actually make the user feel satisfied.

2.3 Classification of Kano Quality Attributes

Based on the way users select quality attributes and quality content, they will be categorized using different semantics. By comparing the bipolar questionnaires and Kano quality attribute interpretation tables, the "Kano quality attributes" are classified.
Referencing the quality analysis factors of Matzler and Hrinterhuber (1988) (as shown in Table1), choose one of the five statements that best expresses the meaning in a single choice format. **1.** I like it that way**, 2.** It must be that way, **3.** I am neutral, **4.** I can live with it that way, **5.** I dislike it that way, as questionnaire answers. Use the results selected from the positive and negative questions to analyze the corresponding Kano quality attributes and conduct demand assessments.
Through the test results of distributing questionnaires and obtaining users' emotional attributes through the questionnaires, the "quality attributes" of the users' responses are obtained statistically.

Table 1: Kano Two-Dimensional Quality Attribute Comparison Table

		Reverse side question item				
		I like it	It must be	I am neutral	I can live with it that way	I dislike it
Positive side question item	I like it	Invalid elements	Attractive Quality (A)	Attractive Quality (A)	Attractive Quality (A)	One-Dimensional Quality (O)
	It must be	Reversed elements	Indifferent Quality (I)	Indifferent Quality (I)	Indifferent Quality (I)	Must-Be Quality (M)
	I am neutral	Reversed elements	Indifferent Quality (I)	Indifferent Quality (I)	Indifferent Quality (I)	Must-Be Quality (M)
	I can live with it that way	Reversed elements	Indifferent Quality (I)	Indifferent Quality (I)	Indifferent Quality (I)	Must-Be Quality (M)
	I dislike it	Reversed elements	Reversed elements	Reversed elements	Reversed elements	Invalid elements

Source of information: Matzler, K and Hinterhuber, H.H. (1988)

2.4 Customer Satisfaction Coefficient (CSC)

Matzler and Hrinterhuber (1988) proposed improvement criteria for quality attributes. The "Kano quality attributes" do not fully present whether the "quality is sufficient". By applying the Customer Satisfaction Coefficient (CSC), the impact on the overall user "satisfaction" can provide an important reference for the design of future school campus construction, as shown in the following formulas:

Enhance Satisfaction Coefficient Index: $(A + O) / (A + O + M + I)$ (1)

Reduce Dissatisfaction Coefficient Index: $-(A + O) / (A + O + M + I)$ (2)

where: A: Attractive, O: One-dimensional, M: Must-be, I: Indifferent

After statistical analysis, when the "Enhance Satisfaction Coefficient Index" in Equation 1 is closer to 1, it indicates that the impact of that quality content on user demand satisfaction is greater. When the "Reduce Dissatisfaction Coefficient Index" in Equation 2 is closer to -1, it represents that the quality content has a greater degree of user dissatisfaction. Therefore, by prioritizing or adjusting items with index scores close to 1 and -1, it will help campus construction better meet user planning needs.

3. Research Design and Implementation

The main research subjects of this study are the parents of School A. The content is divided into two parts. The first part is the subjects' basic information, including: gender, age, affiliated group. The second part is the questionnaire content, using Kano's two-dimensional quality model bipolar questionnaire, which is a self-compiled questionnaire by the researcher.

3.1 Questionnaire Structure

The main research subjects of this study are teachers, staff, parents and others of School A. Questionnaires were distributed through online questionnaires and paper questionnaires. The content is divided into two parts. The first part is the subjects' basic information, including: gender, age, affiliated group. The second part is the questionnaire content, using Kano's two-dimensional quality model bipolar questionnaire. The question structure is based on the three aspects and ten indicators of the DQI model to explore the important items of building needs, and 58 positive questions were designed, with a total of 116 two-way questionnaire questions.

3.2 Questionnaire Content

The design of this research questionnaire is based on the three major design aspects of DQI to develop the questionnaire topics of this research, with a total of three major aspects and ten items.

The first Functionality aspect has three indicators of Use, Access and Space. The original "Campus buildings can improve organizational operational efficiency (FU2)" is changed to "Campus has long-term care/elderly care buildings (FU2)"; "Campus buildings allow users to create more activities (FU3)" is changed to "Campus has childcare/infant care buildings (FU3)"; "Activities and work within campus buildings are safe (FU4)" is changed to "Campus has community mental health center buildings (FU4)"; "Campus buildings can adapt to future space expansion or change needs (FU5)" is changed to "Campus has social housing buildings (FU5)"; "Air conditioning, telecommunications, plumbing and drainage pipe systems are adjustable (FU7)" is changed to "Campus buildings have community parking lots (FU6)"; "The use of interior space in campus buildings is flexible (FU6)" is changed to "The use of interior space in campus buildings is diverse (FU7)". There are 38 positive and negative questions.

The second Building Quality aspect has three indicators: Performance, Engineering and Construction. There are 36 positive and negative questions.

The third Impact aspect has four indicators: Urban and Social Integration, Internal Environment, Form & Materials, and Character & Innovation. There are 42 positive and negative questions.

Each question has 5 options: "Dislike", "Can Tolerate", "No Feelings", "Must Be", and "Like" representing five different levels of psychological feelings, all single choice questions. A total of 58 positive questions and 58 negative questions. The questionnaire survey content is divided into four parts, with a total of 116 questions. The questionnaire coding refers to the indicator content of DQI, designed to meet the needs of School A's education staff, and is coded. The original indicators were coded with the first letter of the construct and item number, for example: the first question under the functional construct was coded as FU1, and the reverse question was FU1-1.

4. Research Analysis and Results

A total of 23 parent group questionnaires were collected in this study. After removing 3 invalid questionnaires, there were 20 valid questionnaires. Among the affiliated groups, there were 17 parent subjects and 3 other subjects.

Regarding the analysis of the questionnaire content, this section takes the construct as the analysis target to find out the Kano two-dimensional quality model results of the parent group, analyze the quality attributes of the item, and analyze the differences.

4.1 "Use" Analysis of the Parents Group

First, the "Functionality" analysis of the parents group is analyzed. According to the statistical analysis of the functionality construct content of the parents group questionnaire, the results of quality attributes, number of people, percentage of people, satisfaction enhancement index, and dissatisfaction elimination index are shown in Tables 2 to 4.

In the "Use" analysis, "1. Campus buildings can meet the needs of different users (FU1)", "3. Campus has childcare/infant care buildings (FU3)", "6. Campus buildings have community parking lots (FU6)" , and "7. The use of interior space in campus buildings is diverse (FU7)", a total of 4 questions belong to "one-dimensional" quality and should be prioritized for implementation.

"2. Campus has long-term care/elderly care buildings (FU2)" and "5. Campus has social housing buildings (FU5)", a total of 2 questions, belong to "reverse" quality and should not be implemented.

"4. Campus has community mental health center buildings (FU4)" belongs to "attractive" quality. It shows that the parent group will feel satisfied if this item is provided.

Table 2: Statistical Analysis of Parent Group Usage Items in Functionality Dimension

No.	Question	Quality Attribute	Number of Responses	Percentage of Responses (%)	Satisfaction Improvement Index	Dissatisfaction Reduction Index
Use	(FU1)	One-dimensional	10	50.00%	0.684	-0.737
	(FU2)	Reverse	9	45.00%	0.455	-0.182
	(FU3)	One-dimensional	13	65.00%	0.842	-0.789
	(FU4)	Attractive	6	30.00%	0.529	-0.294
	(FU5)	Reverse	11	55.00%	0.111	-0.111
	(FU6)	One-dimensional	6	30.00%	0.714	-0.500
	(FU7)	One-dimensional	12	60.00%	0.850	-0.700

In summary, according to the statistical analysis of the "Use" section of the functional construct for the parent group in Table 2, "1. Campus buildings can meet the needs of different users (FU1)", "3. Campus has childcare/infant care buildings (FU3)", "6. Campus buildings have community parking lots (FU6)", and "7. The use of interior space in campus buildings is diverse (FU7)" should be prioritized for implementation. "2. Campus has long-term care/elderly care buildings (FU2)" and "5. Campus has social housing buildings (FU5)" should not be implemented. "4. Campus has community mental health center buildings (FU4)" would lead to satisfaction if provided.

It can be seen from Table2 that parents do not like the appearance of "long-term care/elderly care buildings (FU2)" and "social housing buildings (FU5)" in the school campus construction, possibly because parents feel that buildings like these are not suitable for children under 12 years old on campus. Parents would be satisfied if the campus has "community mental health center buildings (FU4)", and can also accept not having them.

4.2 "Access" Analysis of the Parents Group

"1. Campus buildings facilitate student entry/exit and parent pickups/drop-offs (FA1)", "2. Campus buildings provide sufficient parking for teachers, angels class parents and visitors (FA2)", "3. Easy access to campus buildings for people with disabilities and wheelchair users (FA3)", "4. Properly planned logistics and waste disposal access (FA4)", "5. Adequate lighting and signage in outdoor spaces, trails, stairs (FA5)", "6. Properly planned fire emergency access that enables rescue work (FA6)", "7. Clear and visible labels on campus building entrances/exits (FA7)" - a total of 7 questions belong to "one-dimensional" quality and should be prioritized for implementation.

Table 3: Statistical Analysis of Parent Group Access Items in Functionality Dimension

No.	Question	Quality Attribute	Number of	Percentage of	Satisfaction	Dissatisfaction

			Responses	Responses (%)	Improvement Index	Reduction Index
Access	(FA1)	One-dimensional	16	80.00%	0.850	-0.900
	(FA2)	One-dimensional	11	55.00%	0.700	-0.650
	(FA3)	One-dimensional	12	60.00%	0.650	-0.900
	(FA4)	One-dimensional	12	60.00%	0.700	-0.700
	(FA5)	One-dimensional	15	75.00%	0.800	-0.900
	(FA6)	One-dimensional	16	80.00%	0.850	-0.950
	(FA7)	One-dimensional	13	65.00%	0.750	-0.850

In summary, according to the statistical analysis of the "Access" section of the functional construct for the parents group in Table3, all 7 questions should be prioritized for implementation.

4.3 "Space" Analysis of the Parents Group

"1. Properly planned layout or area of various spaces within campus buildings (FS1)", "2. Properly planned ratio of usable area to total area within campus buildings (FS2)", "3. Properly planned distance of internal circulation within campus buildings (FS3)", "4. Campus building space planning considers gender friendly issues (FS4)", "5. Campus buildings have adequately planned suitable storage space (FS5)". A total of 5 questions belong to "one-dimensional" quality and should be prioritized for implementation.

Table 4: Statistical Analysis of Parent Group Space Items in Functionality Dimension

No.	Question	Quality Attribute	Number of Responses	Percentage of Responses (%)	Satisfaction Improvement Index	Dissatisfaction Reduction Index
Space	(FS1)	One-dimensional	13	65.00%	0.700	-0.750
	(FS2)	One-dimensional	13	65.00%	0.650	-0.850
	(FS3)	One-dimensional	13	65.00%	0.800	-0.750
	(FS4)	One-dimensional	11	55.00%	0.650	-0.650
	(FS5)	One-dimensional	10	50.00%	0.600	-0.600

In summary, according to the statistical analysis of the "Space" section of the functional construct for the parents group in Table 4, all 5 questions should be prioritized for implementation.

4.4 Summary of "Functionality" for Parents

In terms of the analysis of the functionality construct for parents, it can be seen from Table 4-1 that parents do not like the appearance of "long-term care/elderly care buildings (FU2)" and "social housing buildings (FU5)" in the school campus construction, possibly because parents feel that buildings like these are not suitable for children under 12 years old on campus. Parents would be satisfied if the campus

has “community mental health center buildings (FU4)”, and can also accept not having them. FU2, FU5 and FU4 are all items of EOD participation requirements. It shows that under the influence of EOD participation requirements by the government, parents accept the construction of “community mental health centers” but do not accept the construction of “long-term care/elderly care” and “social housing”.

4.5 “Performance” Analysis of the Parents Group

Next is the analysis of the building quality construct for the parents group. According to the statistical analysis of the building quality construct content of the parents group questionnaire, the results of quality attributes, number of people, percentage of people, satisfaction enhancement index, and dissatisfaction elimination index are shown in Tables 5 to7.

In the "Performance" analysis, "1. Good facility management of campus buildings (BP1)", "2. Durable components and materials used in campus buildings (BP3)", "3. Better soundproofing/daylighting design of campus buildings (BP5)", "4. Appropriate artificial lighting control in campus buildings (BP7)", "5. Appropriate indoor air quality in campus buildings (BP8)" - a total of 5 questions belong to the "one-dimensional" quality and should be prioritized for implementation.

Table 5: Statistical Analysis of Parent Group Performance Items in Building Quality Dimension

No.	Question	Quality Attribute	Number of Responses	Percentage of Responses (%)	Satisfaction Improvement Index	Dissatisfaction Reduction Index
Performance	(BP1)	One-dimensional	16	80.00%	0.800	-0.900
	(BP3)	One-dimensional	17	85.00%	0.850	-0.900
	(BP5)	One-dimensional	17	85.00%	0.900	-0.900
	(BP7)	One-dimensional	14	70.00%	0.800	-0.800
	(BP8)	One-dimensional	15	75.00%	0.750	-0.900

In summary, according to the statistical analysis of the “Performance” section of the building quality construct for the parents group in Table 5, all 5 questions should be prioritized for implementation.

4.6 “Engineering” Analysis of the Parents Group

"1. Water-saving and energy-saving designs or devices in campus buildings (BE1)", "2. Easy maintenance and replacement of engineering systems in campus buildings (BE3)", "3. Campus building design can effectively reduce air conditioning and mechanical ventilation requirements (BE4)", "4. Clear layout and coordination of various engineering systems within campus buildings (BE5)", "5. Clear fire refuge zones and fire prevention strategies within campus buildings (BE6)", "6. Structural design and seismic safety in campus buildings (BE8)" - a total of 6 questions belong

to "one-dimensional" quality and should be prioritized for implementation.

Table 6: Statistical Analysis of Parental Groups on Construction Project Items in the Architectural Quality Dimension

No.	Question	Quality Attribute	Number of Responses	Percentage of Responses (%)	Satisfaction Improvement Index	Dissatisfaction Reduction Index
Engineering	(BE1)	One-dimensional	15	75.00%	0.800	-0.800
	(BE3)	One-dimensional	13	65.00%	0.700	-0.800
	(BE4)	One-dimensional	15	75.00%	0.750	-0.900
	(BE5)	One-dimensional	15	75.00%	0.750	-0.850
	(BE6)	One-dimensional	16	80.00%	0.800	-0.900
	(BE8)	One-dimensional	16	80.00%	0.800	-0.950

In summary, according to the statistical analysis of the “Engineering” section of the building quality construct for the parents group in Table 6, all 6 questions should be prioritized for implementation.

4.7 “Construction” Analysis of the Parents Group

"1. Materials reflect the purpose and function of the building (BC1)", "2. Proper planning of construction materials and methods during construction (BC2)", "3. Safe construction process (BC3)", "4. Consideration of future recycling of components and demolition in campus construction (BC4)", "5. Effective integration of structure, engineering systems and layout in campus buildings (BC5)", "6. Proper integration of interior and exterior finishes in campus buildings (BC6)", "7. Consideration of future climate change impacts in campus building design (BC7)".

Table 7: Statistical Analysis of Parental Groups on Construction Project Items in the Architectural Quality Dimension - Construction Aspect

No.	Question	Quality Attribute	Number of Responses	Percentage of Responses (%)	Satisfaction Improvement Index	Dissatisfaction Reduction Index
Construction	(BC1)	One-dimensional	13	65.00%	0.750	-0.650
	(BC2)	One-dimensional	15	75.00%	0.750	-0.900
	(BC3)	One-dimensional	16	80.00%	0.800	-1.000
	(BC4)	One-dimensional	14	70.00%	0.750	-0.750
	(BC5)	One-dimensional	13	65.00%	0.850	-0.700
	(BC6)	One-dimensional	14	70.00%	0.750	-0.850
	(BC7)	One-dimensional	12	60.00%	0.750	-0.700

In summary, according to the statistical analysis of the “Construction” section of the building quality construct for the parents group in Table 7, all 7 questions should be prioritized for implementation.

4.8 Summary of "Building Quality" for Parents

In terms of the analysis of the building quality construct for parents, it can be seen from Tables 4-4, 4-5 and 4-6 that parents believe all content that meets the building quality construct needs to be included in the planning. This shows that parents expect a school building construction with good building quality.

4.9 "Urban and Social Integration" Analysis of the Parents Group

Finally, there is the analysis of the impact construct for the parents group. According to the statistical analysis of the impact construct content of the parents group questionnaire, the results of quality attributes, number of people, percentage of people, satisfaction enhancement index, and dissatisfaction elimination index are shown in Tables 8 to 11.

In the "Urban and Social Integration" analysis, "1. Integration of skyline, massing and height of campus buildings with surrounding environment (IU1)", "2. Positive environmental contribution of campus buildings to the neighborhood (IU2)", "3. Pleasant feeling around campus building spaces (IU3)", "4. Integration of existing neighborhood facilities with campus buildings (IU4)", "5. Positive help to regional urban landscape from campus building design (IU5)", "6. Neighborhood residents generally like the campus buildings (IU6)" - a total of 6 questions belong to "one-dimensional" quality and should be prioritized for implementation.

Table 8: Statistical Analysis of Parental Groups on Construction Project Items in the Influencing Aspect of Construction

No.	Question	Quality Attribute	Number of Responses	Percentage of Responses (%)	Satisfaction Improvement Index	Dissatisfaction Reduction Index
Urban and Social Integration	(IU1)	One-dimensional	13	65.00%	0.750	-0.750
	(IU2)	One-dimensional	11	55.00%	0.632	-0.789
	(IU3)	One-dimensional	15	75.00%	0.850	-0.850
	(IU4)	One-dimensional	13	65.00%	0.800	-0.650
	(IU5)	One-dimensional	10	50.00%	0.650	-0.500
	(IU6)	One-dimensional	13	65.00%	0.789	-0.789

In summary, according to the statistical analysis of the "Construction" section of the impact construct for the parents group in Table 8, all 6 questions should be prioritized for implementation.

4.10 "Internal Environment" Analysis of the Parents Group

"1. No overcrowding or narrowness in interior spaces of campus buildings (II1)", "2. Relaxing and pleasant public space and circulation planning in campus buildings (II2)", "3. Completion of this campus building allows people to connect to the organization's values or vision", "4. Appropriate control of personnel access in campus buildings (II7)", "5. Good visibility internally and externally in campus buildings (II8)" - a total of 5 questions belong to "one-dimensional" quality and

should be prioritized for implementation.

Table 9: Statistical Analysis of Parental Groups on Construction Project Items in the Influencing Aspect of Internal Environment

No.	Question	Quality Attribute	Number of Responses	Percentage of Responses (%)	Satisfaction Improvement Index	Dissatisfaction Reduction Index
Internal Environment	(II1)	One-dimensional	15	75.00%	0.800	-0.900
	(II2)	One-dimensional	14	70.00%	0.800	-0.900
	(II3)	One-dimensional	14	70.00%	0.900	-0.800
	(II7)	One-dimensional	16	80.00%	0.850	-0.950
	(II8)	One-dimensional	13	65.00%	0.850	-0.800

In summary, according to the statistical analysis of the "Internal Environment" section of the impact construct for the parents group in Table 9, all 5 questions should be prioritized for implementation.

4.11 "Form and Materials" Analysis of the Parents Group

"1. Pleasant and stress-free exterior form of campus buildings (IF1)", "2. Proper planning of campus building orientation and configuration (IF2)", "3. Appropriate and attractive overall textures and colors of campus buildings (IF4)", "4. Reasonable massing and composition of campus buildings (IF5)" - a total of 4 questions belong to "one-dimensional" quality and should be prioritized for implementation.

Table 10: Statistical Analysis of Parental Groups on Construction Project Items in the Influencing Aspect of Form and Materials

No.	Question	Quality Attribute	Number of Responses	Percentage of Responses (%)	Satisfaction Improvement Index	Dissatisfaction Reduction Index
Form and Materials	(IF1)	One-dimensional	11	55.00%	0.700	-0.700
	(IF2)	One-dimensional	13	65.00%	0.750	-0.750
	(IF4)	One-dimensional	12	60.00%	0.750	-0.600
	(IF5)	One-dimensional	13	65.00%	0.800	-0.800

In summary, according to the statistical analysis of the "Form and Materials" section of the impact construct for the parents group in Table 10, all 4 questions should be prioritized for implementation.

4.12 "Character and Innovation" Analysis of the Parents Group

"1. Campus building design with meaningful concepts or ideas (IC1)", "2. Interesting campus buildings that make people want to walk around (IC2)", "3. Campus buildings that connect to the organization's vision or values (IC3)", "4. Campus buildings that attract more centripetal force for teachers, students and staff (IC4)", "5. Significant contribution to new technologies from campus building construction and design (IC5)", "6. Campus buildings that can serve as a model for future similar school construction (IC6)" - a total of 6 questions belong to "one-

dimensional" quality and should be prioritized for implementation.

Table 11: Statistical Analysis of Parental Groups on Construction Project Items in the Influencing Aspect of Features and Innovation

No.	Question	Quality Attribute	Number of Responses	Percentage of Responses (%)	Satisfaction Improvement Index	Dissatisfaction Reduction Index
Character and Innovation	(IC1)	One-dimensional	10	50.00%	0.850	-0.550
	(IC2)	One-dimensional	8	40.00%	0.800	-0.450
	(IC3)	One-dimensional	8	40.00%	0.650	-0.500
	(IC4)	One-dimensional	14	70.00%	0.850	-0.750
	(IC5)	One-dimensional	13	65.00%	0.750	-0.700
	(IC6)	One-dimensional	12	60.00%	0.750	-0.650

In summary, in Table 11 analyzing the "Unique Features and Innovation" dimension under the "Influence" construct for the parent group, all 6 questions should be prioritized for implementation.

4.13 Summary of Parent Influence Construct

Looking at the analysis of the influence construct for parents, based on Table 8, Table 9, Table 10 and Table 11, it can be seen that parents believe that all content meeting the quality criteria of the influence construct needs to be incorporated into the planning. This shows that parents expect the school, in terms of influence, to not only integrate into the city and society, provide high quality internal environments, properly plan the form and materials, but also become an exemplary school building that is interesting and meaningful in terms of unique features and innovation.

5. Conclusions and Recommendations

5.1 Research Conclusions

Looking at the "functional dimension use items" for parents, parents do not like "long-term care/senior care buildings (FU2)" and "social housing buildings (FU5)" to appear in school construction, possibly because parents feel that children under 12 are not suitable to have such building volumes on campus. Parents would be satisfied if the campus has a "community mental health center building (FU4)", and it would also be acceptable without. FU2, FU5 and FU4 are all EOD co-construction requirements. This shows that under the influence of the government's EOD co-construction requirements, parents accept the construction of a "community mental health center" but do not accept the construction of "long-term care/senior care" and "social housing" buildings.

Looking at the analysis of the "architectural quality construct" for parents, they believe that all content meeting the architectural quality criteria needs to be incorporated into the planning. Items under the "performance", "engineering" and "construction" dimensions of the architectural quality construct should all be

prioritized for implementation.
In the "influence construct", parent groups believe items under "integration with the city and society", "internal environment", "form and materials", and "unique features and innovation" should all be prioritized for implementation. This shows that parents expect a school building with good architectural quality to be constructed.

5.2 Research Recommendations

Parents believe that "long-term care/senior care buildings on campus (FU2)" and "social housing buildings on campus (FU5)" should not be included in the co-construction requirements for the school; community mental health center buildings (FU4) are fine whether included or not, while "community parking lots (FU6)" and "childcare/nursery buildings (FU3)" should be included in the school's co-construction requirements.
Parents have stronger and clearer intentions in expressing co-construction requirements. Even though the co-construction requirements were proposed by the government, and the government is also providing funding for constructing the school, parents indicate that "long-term care or senior care buildings" and "social housing buildings" should not be included in the school's co-construction requirements.

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