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The Concept of Behavioural Architecture in the School Design for Special Needs Students – Intelectual Disabilities

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Abstract: Children with special needs (ABK) also have the same right to access education according to their capacity and needs. The education system in Indonesia still faces significant challenges, namely that it is not yet sufficient and does not optimally accommodate the needs of ABK. The observation method focused on individuals with intellectual disabilities, with analysis conducted on identified Behaviours of individuals with intellectual disabilities. For those with mild intellectual disabilities, they can read, perform simple calculations, write, and engage in other simple activities, with abilities equivalent to a normal 8-12 years old. For those with moderate intellectual disabilities, regular and continuous training is needed to perform activities, and only a small percentage can read, write, and count. Their intellectual abilities are more limited, they can be taught, and they have self-care skills and certain abilities equivalent to those of a normal 3-8 years old child. The principles of behavioural architecture in the Concept Design of a Special Needs School for Students with Intellectual Disabilities, applied according to their specific Behaviours, include Safety & Supervision, Safe Circulation Layout, Classroom Size & Space Ratio, Accessibility, Control of Motor Stimuli, Functional Zoning, Flexibility, Building Material & Finishing Material Selection, Easy-to-Understand Wayfinding, and Safe Evacuation Routes. The detailed concept of achieving the above 10 principles gave rise to the design of a Special School for Mild & Moderate Intellectual Disabilities, which is suitable for accommodating various student Behaviours, ensuring their safety, incorporating educational elements, and helping to improve their knowledge and skills.

Keywords: *Children with Special Needs; Special Needs Children; Intellectual Disability; Design for Intellectual Disability; Special Education School; Behavioural Architecture; Behavioural Design.*

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I. INTRODUCTION

Every child has a fundamental right to determine the direction of their life thru quality education. To achieve this, it is necessary to develop intellectual capacity, creativity, and character, which are acquired thru a comprehensive educational process. This is in line with the mandate of the 1945 Constitution of the Republic of Indonesia, Article 31 paragraph (1), which states that every citizen has the right to education. Furthermore, Law No. 20 of 2003 concerning the National Education System defines education as a conscious and planned effort to create a learning environment and learning process so that students actively develop their potential in spiritual, intellectual, personality, skills, and noble character aspects necessary for themselves and society. In this context, children with special needs (CSN) also have the same right to access education according to their capacity and needs. Unfortunately, the education system in Indonesia still faces significant challenges in optimally accommodating the needs of children with special needs.

One of the main challenges is the continued dominance of conventional learning approaches that are more focused on academic achievement, without considering the therapeutic, emotional, and social aspects that are also crucial for the development of children with special needs. In fact, inclusive and adaptive education is essential for creating a responsive and supportive learning environment for children with special needs. According to data from the Central Bureau of Statistics (BPS) in 2017, the number of children with special needs in Indonesia reached 1.6 million. Only 18 percent of children with special needs receive inclusive education services. Of that 18 percent, 115,000 children attend School for students with special needs (SLB), and another 299,000 attend regular schools that implement inclusive education.

Meanwhile, according to data from the Data and Information Technology Center of the Ministry of Education, Culture, Research, and Technology (Data and Information Centre, Ministry of Education, Culture, Research, and Technology) on students with special needs in DKI Jakarta in 2025, the number of children with intellectual disabilities in

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DKI Jakarta reaches 3,051 thousand children. Based on data from the Data and Information Technology Center of the Ministry of Education, Culture, Research, and Technology (Data and Information Centre, Ministry of Education, Culture, Research, and Technology) on students with special needs in DKI Jakarta in 2025, the number of children with intellectual disabilities in East Jakarta is higher than in the other five cities, totaling 1,104 children in DKI Jakarta.

Based on data from the Center for Data and Information Technology of the Ministry of Basic and Secondary Education (Data and Information Centre, Ministry of Basic and Secondary Education) for 2025 regarding the number of School for students with special needs for students with intellectual disabilities in East Jakarta per education level, there are 24 elementary schools with 491 students, 23 middle schools with 597 students, and 20 high schools with 16 students. However, based on the data, the number of high school levels is already sufficient, so the design of a special school building for students with intellectual disabilities, including integrated elementary and middle school levels, is still needed by applying the concept of behavioural architecture, in order to create an adaptive, inclusive, and supportive learning environment that optimizes student development. In addition, the design concept should facilitate and assist various parties involved in improving the effectiveness and efficiency of learning for both teachers and students. This condition underscores the importance of designing educational facilities that not only meet academic needs but also consider the psychological and behavioural aspects of students. In this regard, the behavioural architecture approach becomes highly relevant as a foundation for designing learning environments that are adaptive to the specific characteristics and needs of students with intellectual disabilities. Behavioural architecture emphasizes creating spaces that can naturally respond to and facilitate user Behaviour, while simultaneously supporting social interaction, learning processes, and therapeutic activities.

By utilizing a behavioural architecture approach, the design of the Special School for the Intellectually Disabled in East Jakarta is expected to create an inclusive, educational, safe, and comfortable environment. This environment will not only support students in their learning process but also provide ease for teachers, parents, and other relevant parties in realizing effective, efficient, and humane education.

II. LITERATURE REVIEW ON SPECIAL NEEDS STUDENTS & SCHOOL FOR SPECIAL NEEDS STUDENTS

The first literature that needs to be understood is the Definition of Mentally Retarded Children. The term "intellectual disability" is used to identify children who experience significant developmental delays in intellectual functioning compared to their peers. This obstacle causes delays in cognitive development and adaptive abilities, both in social and academic environments.

Children with mental retardation, commonly known as mental retardation. Mental retardation is a mental disorder that appears before the age of 18. characterized by low intelligence (usually with an IQ below 70) and difficulty adapting to daily routines. Impaired intellectual function is a key characteristic of mental retardation. Children with mental retardation not only have low intelligence levels, but they also find it difficult to cope with the challenges of adapting and developing. Before formal tests to assess intelligence emerged, people with mental retardation were considered individuals who could not care for themselves and were unable to master skills appropriate for their age.

Children with intellectual disabilities exhibit several common characteristics, such as difficulty concentrating, unstable emotional responses, a lack of ability to understand instructions, and a tendency to withdraw from social interaction. According to Government Regulation of the Republic of Indonesia Number 72 of 1991, a child with intellectual disabilities is defined as an individual who has a significantly below-average level of intelligence, accompanied by limitations in adapting to the demands of their surrounding environment. The American Association on Mental Deficiency (AAMD), cited by Grossman in Kirk and Gallagher (1986:116), states that intellectual disability is a condition characterized by significantly below-average general intellectual functioning (IQ $\leq$ 84), accompanied by deficits in adaptive Behaviour, which occurs during an individual's developmental period. Children with this disorder generally have difficulty performing daily activities that require logical understanding and social skills. Children with intellectual disabilities also has following terms:

- Feeble-minded
- Mentally retarded
- Educable
- Trainable
- Totally dependent
- Mental subnormal
- Mental deficit or cognitive deficit
- Mental disability or mental deficiency
- Intellectual disability.

Generally, children with intellectual disabilities are classified into three categories based on the degree of their intellectual limitations, namely:

- Mild intellectual disability
- Moderate intellectual disability
- Severe intellectual disability

➢ *Characteristics of Special Needs Students*

The Behaviour of students with mental disabilities can be examined based on their characteristics. Children with intellectual disabilities have a variety of distinguishing characteristics, and they are divided into four levels based on their level of intelligence. This level is known as the Intelligence Quotient (IQ). Here is the classification of children with intellectual disabilities, including:

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Table 1 Classification and Characteristics of Children with Intellectual Disabilities

Classification	Characteristics
Mild Intellectual Disability (Inferior) (Having an IQ between 51-70)	1. They don't appear to be children with intellectual disabilities to the general public They need to receive education in School for students with special needs, and they can learn practical skills like reading and counting . Gradual support and guidance are greatly needed when they experience excessive social and economic pressure. They can adapt socially and in the workplace for self-development, but this happens slowly.
Moderate Intellectual Disability (Moron) (Having an IQ between 36-51)	1. Slow body movements and speech for periodic communication 2. Can be trained in simple skills 3. Can be guided to do things like simple tasks, allowing them to adapt socially and professionally for self-development, but this is done slowly 4. Cannot care for themselves 5. Able to walk around on their own to familiar places.
Severe Intellectual Disability (Embicille) (IQ between 20-35)	1. Slow motor development 2. Still able to be guided in basic self-care skills 3. Can perform routine/repetitive activities 4. Unable to care for themselves 5. Requires guidance and supervision in an environment.
Profoundly Mentally Retarded (Idiot) (IQ below 20)	1. Very slow in all aspects, with difficult-to-understand development and speech 2. Shows basic emotions like tantrums that are difficult to control 3. Has very minimal motor function 4. Cannot care for themselves 5. Requires extra supervision and guidance 6. May still be able to be trained to use gestures with their feet, hands, and mouth.

Source: Foundation for The Development of Children with Disabilities/YPAC Semarang

➢ *Education Systems for Intellectual Disabilities Students*

Education for children with intellectual disabilities requires a different approach compared to general education, considering their characteristics, cognitive abilities, and special needs. To meet these needs, various educational service models are available, specifically designed to optimally accommodate the academic, social, and emotional development of children with intellectual disabilities. Here are some commonly used educational approaches:

- *Transition Class*

A transition class is a temporary form of educational service for children with special needs, including children with intellectual disabilities. This class can be held in a regular school setting as a form of early integration aimed at facilitating children's adaptation to the social and academic environment. The curriculum used is a modified elementary school curriculum, adapted to the abilities and needs of students with intellectual disabilities so that the learning process remains effective and focused.

- *School for Students with Special Needs (Category C & C1)*

School for students with special needs (SLB) are formal educational institutions specifically designed for children with special needs. Category C SLB is for children with mild intellectual disabilities, while category C1 SLB is for children with moderate intellectual disabilities. In the SLB environment, each class generally consists of around 10 students with relatively similar ability levels, accompanied by a special guidance teacher. The learning process takes place throughout the school day and focuses on developing cognitive, motor, social, and basic life skills.

- *Integrated Education*

The integrated education model is an educational service where children with intellectual disabilities learn in public schools alongside regular children in the same classroom. However, in practice, children with intellectual disabilities will receive additional support from Special Education Teachers (SETs) who come from the nearest Special Education School (SLB). This mentoring is done for specific subjects that require a differentiated approach. Integrated education is generally intended for children with mild intellectual disabilities who have good adaptability and learning abilities, although at a slower pace.

- *Inclusive Education*

Inclusive education is a modern educational approach that emphasizes the principle of "education for all" without discrimination against children with special needs. In this system, children with intellectual disabilities learn alongside regular students in public schools with equal rights, obligations, and treatment. The learning process in an inclusive classroom typically involves two educators: a regular teacher and a special support teacher who plays a role in providing individualized assistance to children with intellectual disabilities. Although inclusive systems have great potential in building inclusive and participatory learning environments, their implementation in Indonesia is still limited and uneven.

- *Home Schooling Program*

Education Home schooling is an educational alternative provided in the home environment for children with intellectual disabilities who are unable to attend school directly, either in regular or School for students with special

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needs, due to medical reasons or mobility limitations. In this system, the learning process is carried out by Special Education Teachers (PLB) or professional therapists who visit the home periodically. The success of homeschooling heavily relies on the active involvement of parents and coordination with schools or special education service providers.

- *Rehabilitation Centre*

Rehabilitation Centre for children with severe intellectual disabilities who experience multiple functional limitations, such as significant visual, auditory, and motor impairments, educational services in the form of intensive rehabilitation provided at a rehabilitation Centre are required. The main goal of this program is to increase children's independence thru structured training, which includes:

✓ Self-Introduction
✓ Self-Recognition and Understanding
✓ Sensory and Perceptual Stimulation
✓ Gross Motor Skills and Mobility Training
✓ Development of Communication and Language Skills
✓ Fostering Social Interaction and Personal Independence.

In the research conducted, the discussion will focus on the design of School for students with special needs, formal schools, or schools for students with disabilities - for mild (Category C) and moderate (Category C1) intellectual disabilities.

➢ *Special Needs Schools & School for Students with Special Needs: The Intellectual Disabilities Students*

The discussion begins with the definition of School for students with special needs. School for students with special needs (SLB) are formal educational institutions specifically designed to provide learning services to children with special needs, whether physical, intellectual, social, emotional, or a combination of all three. SLB plays a central role in the inclusive education system in Indonesia, serving as a form of special intervention that accommodates the developmental limitations of children with special needs so that they can obtain equal and dignified educational rights.

According to the Department of Education and Culture (1989), School for students with special needs are educational institutions that provide educational programs for children with disabilities. SLB implements a unit education system, which covers educational levels from preparatory, primary, to advanced or vocational education. This is due to the limited availability of general secondary education facilities, which are not yet fully able to accommodate the needs of students with certain disabilities. Therefore, special education services have become a fundamental need. Meanwhile, the Directorate of Child Health Development (2010) defines School for students with special needs (SLB) as formal educational institutions responsible for the learning process for children with special needs.

In its classification system, the levels of special education in Indonesia, according to Government Regulation Number 72 of 1991, consist of:

✓ Special Kindergarten (TKLB)
✓ Special Elementary School (SDLB)
✓ Special Junior High School (SMPLB)
✓ Special Senior High School (SMALB)

➢ *Special Education Category*

School for Students with Special Needs called SLB in Indonesia is categorized into several types. The categorization of SLB based on its specialization according to Law No. 20/2003 Article 32 paragraph 1 is as follows:

- SLB section A for the visually impaired
- SLB section B for the hearing impaired
- SLB section C for the intellectually disabled (C for mild intellectual disability and C1 for moderate intellectual disability)
- SLB section D for the physically disabled (D for mild physical disability and D1 for moderate physical disability)
- SLB section E for the emotionally disturbed
- SLB section F for the speech impaired
- SLB section G for multiple disabilities.

➢ *Standard for the Number of Special Education Teachers*

The regulatory standards that have been implemented by the Minister of National Education, the Minister of State for Administrative and Bureaucratic Reform, the Minister of Home Affairs, the Minister of Finance, and the Minister of Religious Affairs, Number 50/X/PB/2011/SPB/03/ M.PANRB/102011, Number 48 of 2011, 158/PMK.01/2011, and 11 of 2011 regarding the Arrangement and Equalization of Civil Servant Teachers, which contain the number of teachers needed at this SLB C-C1, have been calculated against the number of teachers at the SLB, namely the number of students in each learning group varies depending on the type and disability:

- Teachers who teach special education at the Elementary Special School (SDLB) level are taught by class teachers using a thematic approach
- Each learning group is taught by one teacher when taking certain subjects
- Subject teachers at Elementary School for students with special needs (SDLB) consist of teachers of: Religion, Physical Education, Skills, Orientation and Mobility Teachers, Building Communication of Sound and Rhythm Perception Teachers, Self-Development Teachers, Personal and Social Development Teachers, and Movement Development Teachers
- The mandatory teaching hours of 24 face-to-face hours per week are used as the divisor
- Subject teachers only teach one type of subject that matches their teaching certificate
- The number of teachers is calculated based on the number of planned learning groups in the school and the number of subject hours per week in the curriculum structure
- If more than one religious education is taught in the school, the number and type of religious teachers are adjusted to the needs and applicable regulations.

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- *Maximum Teacher-Student Ratio for Each Type of Disability, as Follows:*

✓ Visually impaired, Mild Intellectual Disability, Hearing impaired, Speech impaired
✓ Mild Physical Disability and Emotional Disturbance = 1:10
✓ Moderate Intellectual Disability, Moderate Physical Disability, Multiple Disabilities and Autism = 1:5
✓ For specific cases such as Severe Multiple Disabilities and Autism = 1:1.

➢ *Review of Theory for School for Students with Special Needs Category C and C1 (SLB.C & C1)*

The education of children with intellectual disabilities requires a special approach tailored to their cognitive, emotional, and social characteristics. In this context, School for students with special needs category C (SLB-C) exist as a form of formal education service specifically designed for children with intellectual disabilities or mental retardation. This school provides a more conducive and focused learning environment for children with intellectual disabilities compared to public schools. This is due to the adapted curriculum structure, more individualized teaching methods, and a learning environment designed to be psychosocially stimulating while remaining safe and controlled. SLB C is specifically for children with mild intellectual disabilities (educable and trainable), and SLB C1 is specifically for children with moderate intellectual disabilities (trainable).

➢ *Allocation of Special School for Intellectual Disabilities Category C & C1*

Table 2 Allocation for SLB C & C1

School for Students with Special Needs (SLB Category C/Mild)	School for Students with Special Needs (SLB Category C1/Moderate)
For mild intellectual disability	For moderate intellectual disability
Having an IQ between 50-70	Children have an IQ between 29-49
Capable of being educated	Children are trainable
Regular and special classes can be included.	Maximum number of students per Class/Group
Can read, do simple arithmetic, write, and perform other simple activities	• Regular and continuous training is needed to be able to perform activities. • Only a small percentage can read, write, and count. • Intellectual abilities are more limited. • They can be taught. • Self-care skills and certain abilities.
His abilities are equivalent to those of a normal 8-12 year old	Equivalent abilities of a normal 3-8 year old child

Source: Foundation for the Development of Children with Disabilities/YPAC Semarang

➢ *Curriculum Structure for SLB.C-C1*

The curriculum structure for Special Elementary Schools (SDLB) categories C and C1 is regulated in Appendix I of the Regulation of the Director General of Basic and Secondary Education Number: 10/D/KR/2017 dated April 4, 2017. This regulation covers the curriculum structure, core competencies-basic competencies (KI-KD), and implementation guidelines for the 2013 Special Education Curriculum. The curriculum structure is divided into three program groups, as follows:

➢ *Elementary School Curriculum*

Subjects & Time Allocation for Grades I-VI with face-to-face sessions @30 minutes (per week)

- *Group A:*

✓ Religious Education & Character Development (24x face-to-face @30 minutes)
✓ Pancasila and Citizenship Education (12x face-to-face @30 minutes)
✓ Indonesian Language (21x face-to-face @30 minutes)
✓ Mathematics (17x face-to-face @30 minutes)
✓ Natural Sciences (6x face-to-face @30 minutes)
✓ Social Sciences (6x face-to-face @30 minutes)

- *Group B:*

✓ Arts and Crafts (78x face-to-face @30 minutes)
✓ Physical Education, Sports, and Health (12x face-to-face @30 minutes)

- *Group C:*

✓ Special Needs Program (24x face-to-face
✓ @30 minutes)

➢ *Junior High School Curriculum*

- *Subjects & Time Allocation for Grades VII-IX with Face-to-Face Sessions @35 Minutes (Per Week) Group A:*

✓ Religious Education & Character Development (6x face-to-face @35 minutes)
✓ Pancasila and Citizenship Education (6x face-to-face @35 minutes)
✓ Indonesian Language (6x face-to-face @35 minutes)
✓ Mathematics (6x face-to-face @35 minutes)
✓ Natural Sciences (6x face-to-face @35 minutes)
✓ Social Sciences (6x face-to-face @35 minutes)
✓ English Language (6x face-to-face @35 minutes)

- *Group B:*

✓ Arts and Crafts (6x face-to-face @35 minutes)
✓ Physical Education, Sports, and Health (6x face-to-face @35 minutes)
✓ Elective Skills (54x face-to-face @35 minutes)

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- *Group C:*

✓ Special Needs Program (6x face-to-face
✓ @35 Minutes)

➢ *Curriculum of Skills for SLB C & C1*

There are several special self-development and skills programs for children with intellectual disabilities. These programs are also available in SDLB and SMPLB.

Table 3 Self-Development Program Competency Standards for SDLB.C-C1

No	Competency Standards	Basic Competencies
1	Able to care for oneself	1. Knows how to eat and drink 2. Eats and drinks independently 3. Maintains body hygiene 4. Keeps body healthy
2	Self-Care Skills	1. Wearing underwear 2. Wearing outerwear 3. Wearing shoes 4. Caring for clothing 5. Applying makeup 6. Maintaining hair
3	Able to Maintain Self-Safety	1. Overcoming danger 2. Controlling oneself from danger
4	Able to Communicate with Others	1. Communicate verbally (orally) Communicate non-verbally (using pictures and gestures) 3. Communicate using gestures 4. Communicate in writing
5	Ability to Adapt to the Environment	1. Playing with friends 2. Conducting environmental orientation 3. Cooperating within the family environment

Source: National Education Department, 2006

Table 5 Self-Development & Skills Program Competency Standards for SMPLB.C-C1

No	Competency Standards	Basic Competencies
1	Self-Care	1. Following proper eating and drinking etiquette 2. Making drinks 3. Simple cooking 4. Maintaining body health 5. Using sanitary pads (for women)
2	Personal Grooming	1. Wearing underwear 2. Wearing outerwear 3. Wearing shoes 4. Maintaining clothing cleanliness 5. Applying makeup 6. Maintaining hair cleanliness
3	Maintaining Personal Safety	1. Overcoming dangers 2. Controlling oneself from danger
4	Communicating with Others	1. Communicating verbally Communicating nonverbally (using pictures and gestures) 3. Communicating in writing
5	Being Skilled at Adapting to the Environment	1. Visiting public service places 2. Using personal facilities 3. Using public facilities 4. Using leisure time 5. Cooperating at school and in the community

Source: National Education Department, 2006

➢ *Facilities and Infrastructure for SDLB & SMPLB C & C1*

In the design of School for students with special needs (SLB) category C-C1 for children with intellectual disabilities, the availability of space must be adapted to the educational level (SDLB, SMPLB) and the type of special needs of the students. Each level has space requirements that support the teaching and learning process optimally based on the intellectual and behavioural characteristics of the students. Referring to the Minister of National Education Regulation No. 33 of 2008 concerning Standards for Facilities and Infrastructure for School for students with special needs in Elementary Schools (SDLB) and Special Needs in Junior High Schools (SMPLB), school buildings must provide three main categories of rooms, namely:

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- *General Learning Rooms*

✓ Classrooms
✓ Library

- *Special Learning Rooms*

✓ Self-Care Room
✓ Skills Room

- *Support Rooms*

✓ Principal's Office
✓ Teacher's Room
✓ Administration Room
✓ Place of Worship
✓ School Health Unit Room
✓ Counselling/Assessment Room
✓ Student Organization Room
✓ Toilet
✓ Warehouse
✓ Circulation Room/Corridor
✓ Stairs & Ramp
✓ Playground/Sports Area

III. LITERATURE REVIEW ON BEHAVIOURAL ARCHITECTURE FOR THE SCHOOL FOR INTELLECTUAL DISSABILITIES STUDENTS

According to Clovis Heimsath, AIA, in the book Behavioural Architecture, toward an accountable design process, Clovis Heimsath, a leading architect and academic, in his book Behavioural Architecture: Toward an Accountable Design Process, argues that the concept of Behaviour in architecture is not merely a person's physical activity within a space, but rather a reflection of awareness of social structures, implying the dynamics of collective human movement in space and time. According to Heimsath, understanding human Behaviour in space is a fundamental step in creating responsible architectural designs. By understanding how humans behave when moving, interacting, and engaging in activities, architects can design spaces that are not only technically functional but also socially and emotionally relevant.

➢ *Principles for Behavioural Architecture*

Carol Simon Weisten and Thomas G. David in Architectural Principles and Behavioural Applications (1987) explain four main principles in behavioural architecture:

- Design Communication and Users: The design must be clear and easy for users to understand thru the building's form and layout, so that the function and purpose of the space can be understood. The requirements that must be met are:

✓ Reflection of the building's function
✓ Showing the correct scale and proportions and being enjoyable
✓ Showing the materials and structure that will be used in the building.

- Physical and Psychological Comfort: The design should provide comfort, both physical (air circulation, lighting) and psychological (a supportive visual atmosphere).

➢ *Principles for Behavioural Architecture at School for Students with Special Needs for Intellectual Disability*

- *Safety and Supervision*

Spaces should be safe (without sharp corners, non-slip materials) and designed to allow educators to easily monitor students. This is important because students with intellectual disabilities often need quick intervention for unexpected Behaviours.

- *Circulation Layout*

Entry and exit routes, corridors, and activity areas are designed to be simple and repetitive so that students can establish routines, reducing anxiety and confusion. Consistent use of circulation patterns helps with behavioural adaptation.

- *Class Size & Space Ratio as Needed*

The recommended facilities/infrastructure standards are based on the number of students per class to ensure more intensive and teacher-student interaction done safely.

- *Accessibility*

Facilities must meet accessibility requirements (access routes, ramps, toilets, signage) according to national technical regulations so that the environment can be reached and used by all students.

- *Sensory Stimulation Control*

Adequate lighting, noise control (soundproofing/ absorbent surfaces), and good ventilation improve comfort and reduce overstimulation or distress Behaviors.

- *Functional Zoning*

Separate formal learning spaces, therapy rooms (occupational/behavioral therapy), quiet/ sensory rooms, and play areas to provide safe spaces for diverse activities and behavioral interventions.

- *Flexibility*

Easily adjustable learning materials (tables, chairs) allow for individual learning method adjustments and behavioral interventions.

- *Friendly Materials & Finishes*

Use soft/safe materials in areas prone to falls, and anti-glare finishes to reduce the risk of injury. Colors and textures were chosen for a calming effect (avoid overly busy patterns).

- *Wayfinding and Simple Directional Signage*

Simple visual cues and directional signs aid orientation. To make it easier for students to understand and recognize the rooms.

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- *Safe Evacuation Routes*
  The evacuation plan and exit access must be simple and equipped with easy-to-understand instructions.

IV. ANALYSIS & CONCEPTUAL DESIGN

Table 6 Implications of Behavioral Characteristics and Space Implementation Concepts, as well as Design Implementation, in Special Elementary and Junior High Schools: Safety & Supervision

	Type of Behaviour	Conceptual Design
	Security & Surveillance	
1	Students with intellectual disabilities often exhibit impulsive Behaviour and have difficulty assessing the risk of danger (e.g., running without paying attention to their surroundings).	**Architectural:** • The space design should allow for direct supervision/accessibility by teachers from various points, thus avoiding blind spots. • The building design should be safe (without sharp corners, aiming for 90-degree angles, and using non-slip materials). • Eliminate the use of windows/glass, or if used, they should be located at the top of the room, especially in classrooms. • The site should be enclosed by a safety fence of sufficient height to allow for direct supervision/accessibility by teachers. **Interior:** • Use furniture that is safe for students with intellectual disabilities. • Use low and open furniture to maintain visibility. • Provide observation/supervision areas for teachers.
2	There's a tendency to get easily distracted by small things around.	
3	High tendency toward new places/environments.	
	Design Implementation	**Architectural:** • Non-layered classroom placement facing the corridor or central main circulation, making it easy to supervise from the teacher's room. • The layout is designed to be visually open, for example, with transparent glass windows positioned above so they can be seen and natural lighting that doesn't distract students. • Use a simple access control system (doors with secure locks but easy for teachers to operate). **Interior:** • Sharp corners on tables/chairs are rounded, and furniture is made from materials that are not harmful to students, such as HDPE. Furniture is attached to the walls in room corners to prevent collisions. • Low furniture is used (shelves, tables, cabinets no higher than the student's seated eye level). • Strategic areas are provided within the rooms to maximize teacher supervision of students during activities.

Source: Researcher Analysis

Table 7 Implications of Behavioral Characteristics and Conceptual Design as well as Design Implementation in Special Elementary and Junior High Schools: Circulation System

	Type of Behavior	Conceptual Design
	Clear Circulation Layout	
1	Students with intellectual disabilities often have difficulty understanding spatial direction and sequence.	**Architectural**: • The circulation flow from room to room is designed to be simple, avoiding complex branching. • Design linear and simple circular circulation paths, connecting indoor and outdoor spaces without complicated intersections. • Corridors should not have many intersections for easy orientation. • Clearly separate vehicle and pedestrian circulation. **Interior:** • Use different colors or floor textures to mark specific paths. • Use visual guide lines (e.g., patterns on the floor) to make navigation easier.
2	They may not be able to develop complex movement patterns or engage in unusual routines.	
3	There is a tendency to explore or move from place to place in groups or alone.	
	Design Implementation	**Architectural:** • Minimize intersections or confusing branches from outside the

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		building to inside, as well as within the building. • Create linear circulation with one-way paths that are easy to follow from the entrance to each zone (classroom, therapy, toilet, dining room). • Add natural lighting along the corridors to create a visual rhythm that aids orientation. • Use orientation elements such as trees, murals, or simple but unobtrusive signage as direction markers. • Separate vehicle and pedestrian circulation, such as by limiting them with gardens or sidewalks so that they do not interfere with each other. **Interior:** • Use different (simple) floor patterns or colors for each main path, for example, green for the path to the classrooms, blue for the therapy rooms.

Source: Researcher Analysis

Table 8 Implications of Behavioral Characteristics and Conceptual Design in Special Elementary and Junior High Schools: Class Size & Class Ratio

	Type of Behavior	**Conceptual Design**
	Class Size & Class Ratio	
1	The concentration abilities of students with intellectual disabilities are limited and tend to be easily distracted by noise.	**Architectural:** • Classroom sizes are proportioned to the number of students. • Room ratios are adjusted to accommodate therapy needs, skills classes, and break areas to avoid overcrowding. • Use high ceilings in the building and rooms. **Interior:** • Add empty space inside the room for activity areas or discussions between teachers and students.
2	Students with intellectual disabilities must maximize their potential thru intensive interaction.	
3	There is a tendency to explore or move places in groups or individually.	
	Design Implementation	**Architectural:** • Classroom sizes are designed differently from typical classrooms. Based on standard literacy, the minimum classroom space ratio is stated as 3 m^2 per student. For example, for a learning group with fewer than 5 students, the minimum classroom area is 15 m^2. • Ceiling height in rooms is kept to a minimum (>3 m) to make the space feel spacious. **Interior:** • Use a flexible layout such as a circular seating area in front of the teacher, an activity area in the middle, and a quiet area in the corner with a soft carpet.

Source: Researcher Analysis

Table 9 Implications of Behavioral Characteristics and Conceptual Design as well as Design Implementation in Special Elementary and Junior High Schools: Accessibility

	Type of Behavior	**Conceptual Design**
	Accessibility	
1	1 Some students have motor impairments or require mobility assistance	**Architectural:** • Facilitate ramps & elevators • Design door sizes for rooms. • Flat floor design/no changes in floor level. • Requires easily accessible pathways without obstacles or extreme level changes. • Avoid door thresholds in rooms and create smooth floor transitions. **Interior:** • Provide wide pathways between furniture. • Furniture should be adjusted to the height and motor skills of the students.
2	They tend to move slowly and panic easily when hindered.	

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	Design Implementation	**Architectural:** • Provide ramps for some students using wheelchairs with a maximum slope of 1:12, a width of 1.2–1.5 m, and handrails on both sides, and use flexible elevator door sizes for some students using wheelchairs. • Door sizes in spaces such as classrooms, restrooms, skills rooms, and other rooms that do not hinder student mobility, especially those using wheelchairs. • Important rooms are easily accessible by elevator with large, icon-labeled buttons. • Flat floor design/no change in floor level. **Interior:** • Use tables and shelves that are 70–80 cm high. • Furniture should not be placed too close together so as not to hinder mobility for some students who use wheelchairs (minimum 1.2 m).

Source: Researcher Analysis

Table 10 Implications of Behavioral Characteristics and Conceptual Design as well as Design Implementation in Special Elementary and Junior High Schools: Motor Stimulus Control

	Type of Behavior	**Conceptual Design**
	Motor Stimulus Control	
1	Students with intellectual disabilities are easily panicked by environments that are too crowded or noisy.	**Architectural:** • Avoid reflective surfaces and excessive direct light. • Design for quiet, shaded outdoor spaces for reflective activities or play. • Use sound-absorbing materials (grass, wood, natural stone). **Interior:** • Apply acoustic dampening to the walls/ceiling. • • Use soft and neutral colors like pastels or earth tones.
2	Some experience sensory overload	
	Design Implementation	**Architectural:** • Avoid glossy surfaces and use indirect lighting (hidden lights or diffusers). • Plant vegetation between play areas and roadways to reduce noise. **Interior:** • Use soft colors (cream, pastel, light green, light blue) for walls and furniture. • The acoustics of the walls and ceiling are soundproofed (acoustic panels or acoustic carpets) to reduce echoes in spaces that are intensive for student activities and circulation areas/corridors between rooms.

Source: Researcher Analysis

Table 11 Implications of Behavioral Characteristics and Conceptual Design as well as Design Implementation in Special Elementary and Junior High Schools: Functional Zoning

	Type of Behavior	**Conceptual Design**
	Functional Zoning	
1	Students with intellectual disabilities very much need a clear separation (zoning) between their spaces and activities, such as learning, playing, therapy, and resting, to avoid confusion.	**Architectural:** • Zoning of spaces/areas according to student needs • The site is divided into zones: a quiet zone (learning & therapy), an active zone (playing & sports), and a transition zone (connecting paths). **Interior:** • Using visual transition elements (colour, texture) so that the zone changes feel gradual and distinct.
2	Students with intellectual disabilities tend to get confused if learning, playing, and eating areas are mixed.	
	Design Implementation	**Architectural:** • Separate zones such as classrooms, therapy rooms, and skills rooms. • Room layouts are arranged based on activity intensity, gradually transitioning from quiet to active areas.

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		• Teacher rooms/duty rooms are placed in the centre of the learning zone for easy supervision in all directions. • Separate public areas (visitors, parking) from student areas with fences or boundary gardens. **Interior:** • Use thematic colours for each zone so that students can easily remember them (e.g., therapy zone = soft blue).

Source: Researcher Analysis

Table 12 Implications of Behavioral Characteristics and Conceptual Design as well as Design Implementation in Special Elementary and Junior High Schools: Flexibility

	Type of Behavior	**Conceptual Design**
	Flexibility	
1	Students with intellectual disabilities need adaptable spaces that suit their daily activities.	**Architectural:** • The design of the space allows for changes in layout without disrupting students' routines. • Students' outdoor activities can be varied (playing, planting, gymnastics, drawing). • Versatile flat surfaces on the site area (e.g., smooth paving/asphalt/plaster can be used for playing or ceremonies). **Interior:** Flexible furniture so teachers can easily adjust activities according to students' ability levels.
2	Students get bored easily and need variety in their activities.	
	Design Implementation	**Architectural:** • Design high ceilings with natural lighting to make the space feel spacious and not oppressive. • Use multifunctional outdoor spaces, such as gardens that can be converted into gathering areas or for light exercise. • Use portable elements in outdoor spaces (folding benches, folding tables, tent canopies). **Interior:** • Use modular and easily movable furniture, such as folding tables, lightweight chairs, and wheeled shelves. • Use multifunctional walls that can serve as whiteboards, sensory media, or display areas for artwork.

Source: Researcher Analysis

Table 13 Implications of Behavioral Characteristics and Conceptual Design as well as Design Implementation in Special Elementary and Junior High Schools: Eco-Friendly Materials & Finishing

	Type of Behavior	**Conceptual Design**
	Eco-Friendly Materials & Finishing	
1	Students with intellectual disabilities may exhibit hyperactive, impulsive, or risk-unaware behaviour.	**Architectural:** • Use soft-textured materials to provide a sense of security. • Choose impact-resistant, non-toxic, and non-slip materials. • The lower walls (±1 m) can be covered with wood panels or solid foam. **Interior:** • Avoid sharp corners on tables and cabinets.
2	Students often engage in direct activity with external surfaces (sitting on the floor, touching/patting walls).	
	Design Implementation	**Architectural:** • Use smooth, non-sharp, and non-toxic materials such as rubber, matte laminated wood, or soft HPL. • Avoid hard materials like smooth ceramic, but you can use non-slip vinyl or rubber flooring. **Interior:** • The furniture is rounded at every corner for safety.

Source: Researcher Analysis

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Table 14 Implications of Behavioral Characteristics and Conceptual Design as well as Design Implementation in Special Elementary and Junior High Schools: Wayfinding

	Type of Behavior	Conceptual Design
	Wayfinding	
1	Students with intellectual disabilities are easily lost or disoriented if spatial orientation is unclear.	**Architectural:** • The building's form is easy to read/the layout is not complex. • The arrangement of spaces is sequential and radial for easy recall, aligning with student activity patterns. • Use natural orientation inside and outside the building (light or gardens) as directional guides. **Interior:** • Simple graphics or icons are more effective than long text. • Use visual symbols and consistent colours for each area (e.g., blue for classrooms). • Directional signs should be at children's eye level and not excessive.
2	Students understand symbols and colours more easily than writing.	
	Design Implementation	**Architectural:** • U/L/loop massing (simple & not confusing). • Main paths are wider, brighter, and without sharp turns. • Classrooms are placed repeatedly for easy recognition. **Interior:** • Add a simple map near the main entrance with illustrations of building shapes and important areas. • Use visual icons (images, symbols, colours) for each space (e.g., book images for the library, cutlery for the canteen). • Each zone has a different dominant colour that is consistent on the walls, floors, and doors. • Install the directional signs at a child's eye level (±1.2 m).

Source: Researcher Analysis

Table 15. Implications of Behavioral Characteristics and Conceptual Design as well as Design Implementation in Special Elementary and Junior High Schools: Safe Evacuation Route

	Type of Behavior	Conceptual Design
	Safe Evacuation Route	
1	In emergency situations, students with intellectual disabilities may lose their ability to think rationally and need clear physical guidance	**Architectural:** • Wide evacuation routes, without obstacles/minimal sharp turns. • Avoid changes in floor level leading to evacuation routes. • Each room must have direct access to a safe area or easily recognisable assembly point. **Interior:** • Provide lighting and security for evacuation routes. • Use high-contrast coloured evacuation markers and simple pictograms. • Floor line markings to guide evacuation steps. • Use handrails in corridors and evacuation routes.
2	Students with intellectual disabilities need teacher supervision and unobstructed evacuation routes during emergencies.	
3	Difficulty understanding complex verbal instructions, requiring clear visual guidance.	
	Design Implementation	**Architectural:** • Evacuation routes are at least 1.5 m wide, without steep inclines or obstacles. • Emergency exits open automatically outwards with contrasting green pictogram signs. • The evacuation area (assembly point) should preferably be in an open, shaded, and safely fenced garden. • The lobby serves as a secondary assembly point if it rains or in case of panic. • Each classroom has direct access to the main evacuation corridor. • The meeting point is provided with a canopy and a soft surface, as well as large visual symbols (e.g., a green star) for easy recognition.

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		Interior: • Use emergency lights and floor lighting for guidance in the dark, and protect wall corners with corner guards. • Handrails on both sides of the wall at a height of 70–90 cm, oval in shape with rounded ends to prevent injury, and made of non-slip and non-cold materials (e.g., PVC/woodgrain).

Source: Researcher Analysis

V. CONCLUSION

The education system in Indonesia is striving to meet the significant challenge of optimally accommodating the needs of children with special needs by applying the 10 Principles of Behavioural Architecture to the design of School for students with special needs for Mild & Moderate Intellectual Disabilities. This design not only accommodates various student behaviours but also ensures their safety, educates students, and helps improve their knowledge and skills. The observation method for Mild & Moderate Intellectual Disabilities resulted in the design concept for School for students with special needs for Intellectual Disabilities and the implementation of the architectural and interior design aspects, including Safety & Supervision Principles, Safe Circulation Layout, Classroom Size & Space Ratio, Accessibility, Motoric Stimulation Control, Functional Zoning, Flexibility, Building Material & Finishing Material Selection, Easy-to-Understand Wayfinding, and Safe Evacuation Routes. 24 Types of Behaviour of Students with Intellectual Disabilities identified from 10 Principles gave rise to 33 Architectural Design Concepts and 19 Interior Concepts as seen and described on the table 6 – 15 above. From these concepts, a total of 53 Design Implementations were presented, including 34 Architectural Design Implementations and 19 Interior Implementations as also described on the table 6 – 15 above. It is believed that with these Architectural & Interior Design Implementations in the School Building for Students with Intellectual Disabilities, students with Mild & Moderate Intellectual Disabilities, with the 24 specific types of behaviour of students with intellectual disabilities as mentioned earlier, will be ensured of their safety, educated, and helped to improve their knowledge & self-skills.

REFERENCES

[1]. Data from the Central Bureau of Statistics (BPS) in 2017 (2017) *The number of children with special needs in Indonesia.*

[2]. Data from the Central Data and Information Centre.

[3]. Ministry of Education, Culture, Research, and Technology (PUSDATIN Kemendikbudristek) (2025). *Students with special needs in DKI Jakarta in 2025.*

[4]. Data from the Central Data and Information Centre of the Ministry of Education, Culture, Research, and Technology (PUSDATIN Kemendikbudristek) (2025). *Students with special needs in DKI Jakarta in 2025 (East Jakarta).*

[5]. Data from the Central Data and Information Centre of the Ministry of Basic and Secondary Education (PUSDATIN Kemedikdasmen) in 2025 (2025).

[6]. Government Regulation of the Republic of Indonesia Number 72 of 1991 (2025). *A person with intellectual disability is defined as an individual whose intelligence level is significantly below average, accompanied by limitations in adapting to the demands of their surrounding environment.*

[7]. American Association on Mental Deficiency (AAMD) (2025). & Grossman in Kirk and Gallagher (1986:116). *Intellectual disability is a condition characterised by general intellectual functioning.*

[8]. Foundation for The Development of Children with Disabilities/YPAC Semarang (2025). *Classification and Characteristics of Children with Intellectual Disabilities*

[9]. Department of Education and Culture (1989). *School for students with special needs (SLB): educational institutions that provide educational programs for children with physical disabilities or children with disabilities.*

[10]. Directorate of Child Health Development (2010). *The definition of a Special School (SLB) as a formal educational institution responsible for the learning process of children with special needs.*

[11]. Government Regulation Number 72 of 1991 (1991). *Its classification system, the educational level of School for students with special needs (SLB) in Indonesia*

[12]. National Education Law Number 20/2003 Article 32 paragraph 1 (2003). *Categorisation of School for students with special needs (SLB) based on their specialisation*

[13]. Standards of Regulations that have been implemented by the Minister of National Education, the Minister of State for Administrative and Bureaucratic Reform, the Minister of Home Affairs, the Minister of Finance, and the Minister of Religious Affairs Number 50/x/pb/2011/spb/03/m.panrb/10/2011 (2011). *Arrangement and Equitable Distribution of Civil Servant Teachers containing the number of teachers needed at School for students with special needs (SLB) Category C & C1*

[14]. Standards of Regulations that have been implemented by the Minister of National Education, the Minister of State for Administrative and Bureaucratic Reform, the Minister of Home Affairs, the Minister of Finance, and the Minister of Religious Affairs Number 48 of 2011, 158/pmk.01/2011, Year 2011 (2011). *Arrangement and Equitable Distribution of Civil Servant Teachers containing the number of teachers needed at School for students with special needs (SLB) C & C1*

[15]. Foundation for The Development of Children with Disabilities/YPAC Semarang (2025)

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26jan114

[16]. Appendix I of the Regulation of the Director General of Basic and Secondary Education Number: 10/D/KR/2017 dated April 4, 2017 (2017). *The curriculum structure for Special Elementary Schools (SDLB) levels C & C1, as regulated in this regulation, includes the curriculum structure, core competencies-basic competencies (KI-KD), and guidelines for implementing the 2013 Special Education Curriculum.*
[17]. National Education Department 2006 (2006). *Self-Development Program Competency Standards for Special Elementary Schools (SDLB) C & C1*
[18]. National Education Department 2006 (2006). *Self-Development & Skills Program Competency Standards for Special Secondary Schools (SMPLB) categories C & C1*
[19]. Minister of National Education Regulation No. 33 of 2008 (2008). *Standards for Facilities and Infrastructure for Special Elementary Schools (SDLB), Special Secondary Schools (SMPLB) categories C & C1.*
[20]. Clovis Heimsath, AIA (1977). *Behavioural Architecture, Towards an Accountable Design Process.* New York: McGraw-Hill
[21]. Carol Simon Weisten and Thomas G. David (1987). *Architectural Principles and Behavioural Applications: Four Main Principles in Behavioural Architecture*