

Interactive center for the development of learning for autistic children and youth in Atlixco, Puebla

Centro interactivo para el desarrollo del aprendizaje para jóvenes y niños autistas en Atlixco, Puebla

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Abstract

This work aims to publicize the project of Interactive Center for the development of learning for autistic youth and children in Atlixco, Puebla. Developed in the degree of architecture by student and directed by teachers of the Benemérita Universidad Autónoma de Puebla. The research methods used are of a qualitative social nature and multidisciplinary research, since concepts and theories of importance are involved in subjects such as architecture, psychology, pedagogy, psychiatry and sociology. The research began with exploration, with field research within the educational centers, with interviews and life stories of autistic children and adolescents, school administrators, teachers and relatives. In addition, the phenomenological method was used to understand the way of seeing the world of autistic children and adolescents is through subjective knowledge. We proceeded to the explanation of the subject through documentary research, bibliographic, identify the analogous cases, the analysis of the regulations and the development of the project. The first part defines autistic disorder; in the second stage the educational spaces that are responsible for supporting the autistic child or adolescent are described and in the third stage the project is described.

Resumen

Este trabajo tiene como objetivo dar a conocer el proyecto de Centro Interactivo para el desarrollo del aprendizaje para jóvenes y niños autistas en Atlixco, Puebla. Desarrollado en la licenciatura de arquitectura por alumna y dirigido por docentes de la Benemérita Universidad Autónoma de Puebla. Los métodos de investigación utilizados son de carácter social cualitativo e investigación multidisciplinaria, pues intervienen conceptos y teorías de importancia en materias como arquitectura, psicología, pedagogía, psiquiatría y sociología. Se inició la investigación con la exploración, con investigación de campo dentro de los centros educativos, con entrevistas e historias de vida de los niños y adolescentes autistas, administradores de los centros, docentes y familiares. Además, se utilizó el método fenomenológico para comprender la forma de ver al mundo de los niños y adolescentes autistas es a través del conocimiento subjetivo. Se procedió a la explicación del tema por medio de la investigación documental, bibliográfica, identificar los casos análogos, el análisis de la normativa y el desarrollo del proyecto. En la primera parte se define el trastorno autista; en la segunda etapa se describen los espacios educativos que se encargan de apoyar al niño o adolescente autista y en la tercera etapa se describe el proyecto.

Autism spectrum, Educational spaces, Project

Espectro autista, Espacios educativos, Proyecto

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Introduction

The origin of this work was the experience of Architect Karla Polette Díaz Arredondo in mental health centres, where her twin sisters with autism have attended. During the years that Karla Polette has lived with her younger sisters, she was able to understand the enormous sensory difficulties they presented in everyday situations and the stumbling blocks in the academic field. Due to this situation, she wondered why the spaces visited did not have the characteristics her sisters needed for their stay and learning.

Therefore, she developed the topic "Interactive Learning Development Centre for Autistic Children and Youth" where she applied knowledge from psychiatry, psychology, pedagogy and architecture. In the development of the work she came to use the current building regulations in Mexico and sensory architecture for children and young people with ASD (Autism Spectrum Disorder).

The project was developed in Atlixco, Puebla, as there are no specialised centres for the development of learning for autistic children and young people. The existing educational institutions are of Multiple Attention, for all children with motor and mental disabilities, which lack the attention to specialised education for people with autism. Besides, the teacher has to attend to saturated groups with different types of disabilities that prevent an education, because he/she has to attend to children with other disabilities.

The objective of the project was: To implement an architectural project based on sensory and functional design parameters for people with autism spectrum disorder, through the projection of an interactive centre for the development of learning for autistic children and young people in Atlixco, Puebla.

The results achieved were a greater understanding of this disability, recognition of the type of spaces necessary for the architectural design and a product that allowed the conclusion of the terminal work of the degree directed by Mtra. María del Rayo Vázquez Torres and Dr. Alberto Rosendo Castillo Reyes and as an external advisor to Dr. Rosario Nava Ramírez. An executive project was carried out that covered the needs established in the regulations and spaces were annexed to allow for better student development.

The project consisted of 3 buildings, 1 auditorium, 1 greenhouse, sports courts, green areas and parking and control areas.

Autism spectrum

Autism disorder affects 1% of the world's population with abnormal neural development, the causes of autism are believed to be genetic and environmental factors; it is more common in males than in females, in a 4:1 ratio. However, females with autism are more affected with strong impairments in cognition and social perception, executive dysfunction and atypical information processing. Treatment aimed at improving social communication and reducing anxiety and aggression has better outcomes with multidisciplinary assessment and early detection. The word autism derives from the Greek *autt(o)*, meaning acting on oneself, and the suffix *-ism*, indicating the pathological process (Bonilla and Chaskel Roberto, 2013).

Autism spectrum is a disability that affects individuals in different ways, in different senses and in different degrees of intensity. It should be clarified that ASD is not considered a disease; they are characteristic features of the autistic personality with variations from person to person, i.e., the affectations are not the same from one person to another, with different intensities of neurological, physical, cognitive and social levels. It should be noted that it is considered a "new" disability, which is why the study of ASD is in the process of studying the causes of the disability and even how it should be treated.

"Autism is a set of heterogeneous alterations at the neurodevelopmental level that begins in childhood and remains throughout life. It involves alterations in communication and social interaction and in behaviours, interests and activities" (Bonilla and Chaskel Roberto, 2013, p. 19).

Autism Spectrum Disorder (ASD) is a mental developmental disability that is detected in the first three years of an infant's life and affects the functioning of the brain. The definition given by the Autism Society, a non-governmental society, indicates that autism is a psychological and neurological disorder, which affects the mental development of the child or individual.

That is, the affected person has problems in social, communication, cognitive and/or motor development skills, this condition does not allow the development of what is considered normal brain development. The change in the definition of ASD as a concept began in 2013 when the DSM-5 was published, in this document the classification and characteristics of pervasive developmental disorders are set out.

This is due to the fact that there are conditions similar to autism such as: Asperger's Syndrome, Autistic Disorder, Childhood Disintegrative Disorder, Non-Specific Developmental Disorder and Rett Syndrome, as shown in the following Figure 1.

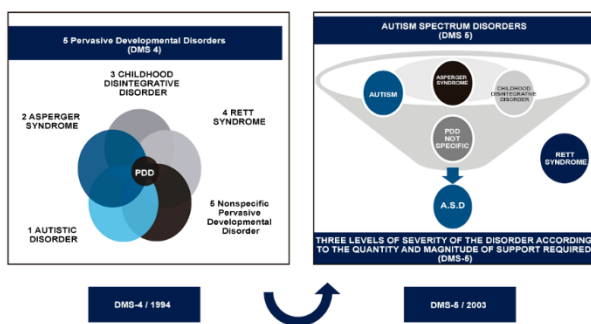


Figure 1 Explanatory graphs of the differences between DMS-4 and DMS-5, In 1994 all these disorders were represented separately, in 2013 it was established that all these disorders should be grouped together, but classified into 3 levels of degree of affection
Source: (Vázquez Ramírez, 2015)

The term autistic was first used in 1908 by Eugen Bleuler to describe some of his patients with schizophrenia. But it was Leo Kanner who in 1943 adopted the term autism to describe for the first time this syndrome, where he applied it to describe the inability to relate to others, language alterations either from not speaking, meaningless messages and repetitive movements without apparent cause (Bonilla and Chaskel Roberto, 2013).

However, the term autistic has a Greek origin that refers to the root auto - from autos - is associated with "one's own, oneself", which can be taken as focusing on oneself. This term was originally used for the symptoms of schizophrenia, but it was not until 1944 that it was addressed to the symptoms of Asperger's syndrome. Hans Asperger, in 1944 the article published *Die Autistischen Psychopathen*, elaborated a study of four children with similar characteristics and named the term autistic psychopathy after Asperger's syndrome.

The Diagnostic and Statistical Manual of Mental Disorders (DSM) together with the International Classification of Diseases are the most widely used manuals in psychiatry for the classification and diagnosis of mental illnesses. In the first manuals, both in the DSM-1, published in 1952, and in the DSM-2, published in 1968, autism was part of schizophrenia and was considered as a psychological state. It is until 1980 that the DSM-2 changes the diagnostic approach of mental disorders, becoming disease categories and the term infantile autism appears. The DSM-3-R of 1987 removed the term infantile autism from this group, replacing it by the term autistic disorder, as it was observed that the symptoms continued even in the adult stage. The DSM-4 of 1994 and the DSM-4-TR of 2000 divided autism into three diagnostic categories: impairment in social interaction; impairment in communication; and restricted, repetitive and stereotyped patterns of behaviour, interests and activities. The latest version of the DSM-5 of 2013 places autism in a single category: autism spectrum disorders (Bonilla and Chaskel Roberto, 2013).

These manuals have made it possible to detect the autistic spectrum, as well as the educational strategies and the characteristics of the spaces where the teaching-learning process takes place. The autism spectrum disorder is so varied, as it ranges from severe to mild cases, the latter may not be detected because the affected person is functional with mild manifestations that go unnoticed or the child may have other affectations with physical problems that do not allow detection.

Therefore, timely detection is very important for a treatment of greater impact, which is why it varies in the time that can be observed from the first months of life, but the diagnosis is made up to 24 months. It can be manifested in early stages by the delay in some developmental patterns such as eye contact or emotional reciprocity with caregivers. The alterations that manifest themselves with greater intensity in the child with autism are the difficulty in expressive and comprehensive language, which affects social performance and the presence of interests or activities that affect their behaviour (Bonilla and Chaskel Roberto, 2013).

In other words, one of the main characteristics of Autism Spectrum Disorder are the sensory-perceptual problems or the process of capturing stimuli from the environment and interpreting them at a cerebral level and they are divided into 3 types: hypersensitivity, hyposensitivity and sensory fascination or self-stimulation that occur all at the same time or at different stages of the person's life. That is why it is necessary to identify the levels of autism to guide the child and adolescent because not understanding what is happening generates a great stress, so it is important to identify the symptoms and characteristics that are shown in the Figure 2.

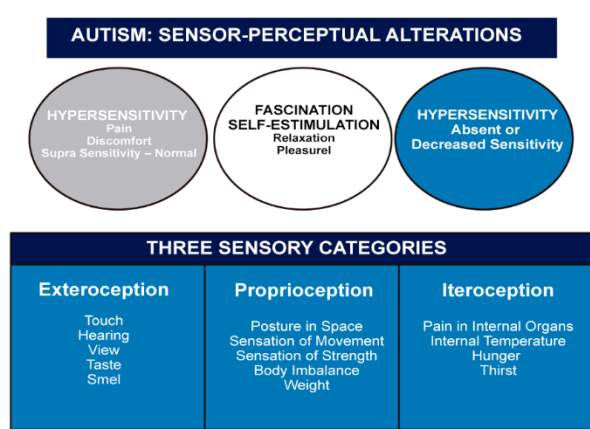


Figure 2 Types of Sensory-Perceptual Alterations in People with Autism Spectrum Disorder

Source: Vázquez Ramírez, M. (2015). *The educational care of students with autism spectrum disorder*. P. 109.

Autistic disorder has different symptoms, the most important of which are hypersensitivity, hyposensitivity and self-stimulation. Hypersensitivity, this is an exacerbated response to stimuli producing stress in the individual, discomfort such as an increase in temperature that causes the affected person to take off their clothes or discomfort when being touched or hugged, the senses of hearing, sight, smell and taste are also affected. Loud sounds alter them and this can lead to accidents as they try to run away from the source of the sound and run or jump without measuring the dangers involved. As for the sense of sight, they usually do not stare at people or things with intense colours, they see them sideways and are sensitive to intense sources of light. In the case of smell, they are sensitive to intense smells and they react aggressively to them. All this is caused by sensory saturation, which becomes a problem for their development and functionality, leading to anxiety and social maladjustment.

In the case of autistic hyposensitivity, it is manifested by a decrease or complete absence of sensations, with loss of tactile, gustatory or auditory sensitivity, it is a form of temporary disconnection and they do not react to stimuli. There is another situation which is self-stimulation, in this case the individual produces repetitive actions, the most common is when balancing, but there is also the repetition of certain sounds and sniffing an object for long periods of time (Díaz, 2021).

Behavioural, psychological and educational therapy is fundamental for the development and coexistence of people with autism, and there are medical programmes that specialise in providing behavioural, psychological, educational or skill development interventions.

"These programmes are often highly structured and intensive and may involve fathers, mothers, siblings and other family members. These programmes can help people with ASD to: Learn the skills needed to live independently. Reduce challenging behaviours. Increase or build on strengths. Learn social, communication and language skills" (NIH, S/F).

It is important to note that according to the 2014 INEGI census in Mexico, 6% of the population suffers from some type of disability. Also, research conducted by Carol Ajax, founder of Spectrum Therapy Center Mexico, indicated that in Mexico in the range of 115-120 people, 1 person has some level of autism spectrum disorder, which is approximately 14% of people with disabilities.

Educational spaces

Regarding the educational spaces where the child or adolescent must learn, they are called CAM (Multiple Attention Centre), they are free special education institutions, but according to the research carried out in the centres, they are not enough to give specialised attention to people with ASD, as they attend to different disabilities and there is no specialised attention to students with autism and to groups of no more than 10 people. The Census of Schools, Teachers and Students of Basic and Special Education, CEMABE 2013, carried out by INEGI and SEP, shows that in Mexico there are 1,527 Multiple Attention Centres, of which 55 are located in the State of Puebla.

CAM centres are well designed under the anthropometric functional aspects, under the regulations of INIFED (National Institute of Educational Infrastructure) for people with motor disabilities. This regulation describes the dimensional guidelines, the mandatory use of access ramps, the number of toilets, among other aspects. There are no regulations applied to the sensory aspects of children and adolescents, which is a very important part of interaction and learning.

It is worth mentioning that there is not a specialised norm for the education centres for people with autism, however, the norm of Basic Education - CAM (CDA-EE-CAM-05) was used. The objective of this regulation is to recommend the necessary elements and conditions of habitability and design in the spaces and services that conform the educational centres based on universal guidelines. As for the electrical installation, the project will be governed by the regulations of obligatory observation, indicated in the Mexican Official Norm. NOM-001-SEDE-2005, current and in force and collaterals referring to the installations for the supply and use of electrical energy.

Also, the INIFED norms for Multiple Attention Centres were used, which indicate the characteristics for the design of the minimum necessary spaces for a centre of this type. INIFED addresses constructive and basic aspects of the CAM's, being this insufficient to be able to design a centre for people with autism, with an empathic approach to their sensory-perceptual problems; therefore, the functions that should be contemplated according to the psycho-pedagogical principles that guide the educational intervention with autistic students were considered. The INIFED criteria seek to promote compliance with the requirements of quality, safety, functionality and sustainability of educational physical infrastructure.

INIFED, is a public body created on 1 February 2018 in the Official Gazette, the main objective of this institution is to strengthen educational infrastructure in Mexico, through the creation of standards and technical specifications.

Regarding the selection of the land INIFED contemplates the following data: Consider the mobilisation times of students attending the special education school should not be more than thirty minutes, avoid dangerous areas, the location of the main access minimum of 8 m. wide to the property; mainly through tertiary roads, although it is allowed to place secondary roads. The dimensions of the site should preferably be rectangular, with a ratio equal to or less than 1:3, with no blind spots to allow supervision of all areas of the campus by teaching and administrative staff.

Open spaces where outdoor activities take place, such as the civic square or sports fields, must have a roof. Indoor green areas will be 30% of the surface of the land, a surface greater than 10 m² without fragmentation with plants from the region. Vehicular and pedestrian walkways will be permeable pavements, at least 50% of the uncovered areas.

For the construction, systems and materials of traditional manufacture of the region will be used, compatible with other systems and the provisions of the Norms and Specifications for Studies, Projects, Construction and Installations of the INIFED will be observed.

In terms of security, it is considered that the entrances to the campus will have a single door to control entry and exit, there should be no secondary doors and the service and manoeuvre entrances should be located close to the street and away from the main entrance for student use. Perimeter walls or fences with a height of 3 m. should allow visibility inside the campus.

Evacuation routes must be signposted at every 20.00 metres or at each change of direction of the roads or walkways, with the written legend: "EVACUATION ROUTE", with arrows in the direction of the evacuation route. Fire extinguishers shall be placed in visible places, easily accessible and free of obstacles, the separation of the extinguishers shall not be greater than 15.00 metres hanging and at a maximum height of 1.50 m from the floor. One of the exterior circulations must be protected from direct or indirect sun radiation, by means of overhangs or eaves; in the case of a one level building, the overhangs or eaves shall be 1.10 metres and with a minimum height of 2.30 metres and in two level buildings, the overhangs shall be a minimum of 2.25 metres.

It should be noted that technology has been introduced in the teaching-learning process, so the project should consider technological resources to support the student. It has been found that children and people with ASD show a great ability to use technology. So the architect must include spaces to place computers, screens and other devices that allow the student to be interested. There are applications for autistic people such as Aprende Infantil, Talk Autismo Imágenes, Pictogram Agenda, Fun Easy Lear Español, which support different areas of knowledge.

In order to carry out the project, the learning strategies must be known, regardless of the degree of affectation of the autistic child or young person, to allow him/her to adapt to coexistence, to carry out an accompaniment and medical treatment. The functions that should be contemplated according to the psycho-pedagogical principles that guide educational intervention with autistic students. ASD (Vázquez, 2015) are the following:

Apply strategies of initial socio-affective teacher-student bonding: Spaces should be developed where the creation of affective ties between the teacher and the student should be fostered to encourage cooperation at the time of wanting to exercise or class therapies.

Move from an over-structured school environment to a standardised one to allow the student to adapt. Architects should consider furniture, containers, coloured ribbons, pedestals, sounds and images that help to identify the location of the different areas, as well as the place where their work tools are located; as well as what actions are allowed in each place and their behaviour within each space. This will allow the student with ASD to feel familiar and safe in such a controlled environment. However, there should be transitional spaces according to their development to introduce them to less controlled environments.

Apply strategies of anticipation and anticipation of environmental changes: Children learn through repetition and the creation of familiar environments, i.e., scenarios are created where they repeat actions of everyday life through play.

Therefore, it is important that educators enable children to anticipate unusual events in their daily lives, so they require spaces that can be easily modified and that allow for constantly changing activities so as not to lose the child's concentration.

Plan activities based on "error-free learning": in this type of activity, the student should not be corrected at the time of teaching, as this leads to the child's disinterest. In addition, the learning environment should be free of visual or auditory distractions, so that the child can stay focused on the activity. It is common for unwanted attitudes to be generated, so the space should be one that allows movement and control of the entrance to the classroom.

Generate learning experiences in natural contexts: There should be spaces outside the classroom to allow interaction with the natural environment and where the child's daily activities can be practised both in the classroom and in the outside area, to be reinforced later by the parents.

Gradually progress from individualised education to collective education: although the student must begin his or her learning process through individualised contexts and strategies, as well as social interaction to reduce stress when he or she is in groups of people known and unknown to him or her. For this reason, the centre must have areas for coexistence with other people, whether in the play areas or in the corridors, for which the physical and emotional safety of the students must be monitored.

Another educational strategy is to move from behavioural over-direction to autonomy, in this case seeking progress in continuous educational support towards independence. Therefore, different types of classrooms should be established until they are implemented in all educational centres in Mexico.

Another objective is to progress from adaptation of the environment to the learner to adaptation of the learner to the environment. The pupil should not be forced to behave and respond in a "normal" way, this represents tolerance to the characteristics of the autistic pupil, which is why we should contemplate spaces where accidents can be avoided with areas where the child can be taken in crisis in order to calm him/her down.

Complement the educational intervention with a responsible medical and alternative treatment, although this does not depend on the architect or the educators, it is necessary to contemplate it, as it is common for students to be medicated to moderate undesirable symptoms; therefore, it is necessary to have a medical service or to locate the educational centre near a medical centre.

On the other hand, people with autism require spaces that help to mitigate the sensorial problems and crises they suffer and signalling systems of the spaces that they can understand, as well as a correct signalling of the spaces with images and colours that allow them to have more independence.

The above is considered in sensorial architecture, which considers psychology for its development, through materials, colours, smells, textures, shapes, lights and shadows. This influences people's subconscious, since all the senses are involved in order to be experienced, i.e., to live in that space.

An example of this situation is the use of colour, as the sense of sight is the most developed in the human being, which is why it has the greatest influence on everything that the brain perceives. Therefore, it is very important to analyse the theory of colour and its application in spaces, as it can affect the behaviour of autistic children and adolescents in ways that can provoke crises in them. Care should be taken in the use of colours in spaces, as they are able to transmit sensations of temperature changes, including spatial and/or emotional ones.

Colours influence emotions and sensations, which is why colours should be carefully chosen for the design of any project. In the case of autistic children and adolescents, it is essential to use colours that help them to concentrate in their therapies and workshops. Therefore, according to Heller's (2004) colour theory, a basic colour palette (image 3) was chosen in the main areas of the learning centre, so that the students are not distracted and different shades of colours can be used, as shown in Figure 3.



Figure 3 Basic colors for the use of common areas and of greater concentration

Source: (Pantone, 2020)

This range of colours is designed to transmit emotions and sensations; for example, the colours that transmit peace, calm and security are blue and white; green allows relaxation and harmony, to create sociable atmospheres, but without being too aggressive. As for the neutral colours that are brown and grey, low luminosity colours allow relaxation and comfort. An example of this is Figure 4.



Figure 4 Multiple classroom of the Centro Autismo Teletón where the colours white, blue and beige are used, which transmit the sensation of calm and without visual distraction in the environment, as well as having intense colours but focused on the didactic material so that the child's attention is directed to them

Source: (Centro Autismo Teletón, 2019)

All educational programmes for students with autism are attached to the cognitive style of students with autism where learning problems and conditions in the classroom are identified, so the division of activities within the areas is developed. Considering the information of the Federation of Castilla y León, (s/f) the following was reached:

The student has a literal and fragmented perception, difficulty in distinguishing between foreground and background information, hypersensitivity and/or hyposensitivity. Visual thinking predominates whose processing focuses on details at the expense of global configuration and contextualised meaning. This is why it is recommended to place 2 colours on the walls, the more intense colour is placed at the top and the lighter colour at the top.

The student's spatial skills in specific subjects should be applied by arranging the furniture with simple shapes and without edges that generate accidents.

In terms of attention, the colours in the layout should make it easier for the student to concentrate, as this favours learning, as the student has "tunnel attention", which consists of not paying attention to stimuli that are outside the selected area. For this reason, sensory oversaturation should not be provoked by an excess of furniture, images or noise.

It is important to focus motivation on the content of their interests, considering that the student has difficulties in attributing sense and meaning to the activity. Therefore, the furniture and the room should have fixed colours so that the student can relate to the activity he/she is doing in each space. Colours that complement the basic palette can also be used to generate spaces where more activity is required, such as yellow, orange and red at points where the child's attention is required, as shown in image 5.

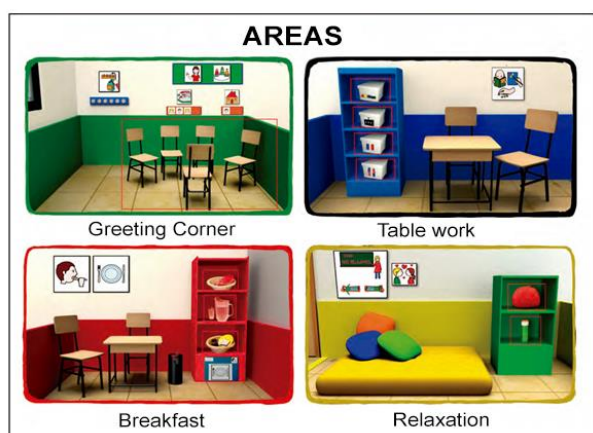


Figure 5 Spatial structuring and well-defined activity areas. The order in the furniture and the different colour in each area allows students with ASD to participate and concentrate on the activities. It is important to avoid excess material
Source: (Vázquez, 2015, p. 125)

The good mechanical memory for data is striking, i.e. information can be retained, even if the content is not understood. There are also difficulties in retrieving information and retaining information while performing a task. For this reason, the activities to be carried out in space are reinforced by means of images. The student may have problems in problem solving, as the strategies learnt in one situation do not transcend to generalisation.

The learning developed in a given situation cannot be applied to the same conditions, but with new approaches, so the spaces should not be modified.

The project

The project is located in Atlixco, Puebla, in the central-western part of the State of Puebla, bordered to the north by the municipality of Tanguismanalco, to the northeast by the municipalities of Santa Isabel Cholula and Ocoyucan, to the southeast by the municipalities of Santa Isabel Cholula and Ocoyucan, to the southwest by the municipality of Puebla, and to the southeast by the municipality of Puebla, to the Southwest with the municipality of Atzitzihuacan, to the South with the municipalities of Huaquechula and Tepeojuma, to the Southeast with the municipalities of San Diego la Meza Tochimiltzingo, to the East with the City of Puebla, and to the West with the municipality of Tochimilco. INAFED (n/d).

The location of the land is the following image 6 where the land is shown in red with the address Av. 20 de noviembre Col. Revolución, C.P. 74270 S/N Atlixco, Puebla. The sketch shows the most relevant places in the area, which would be the ORO ERCO bus terminal and the park of La Revolución.

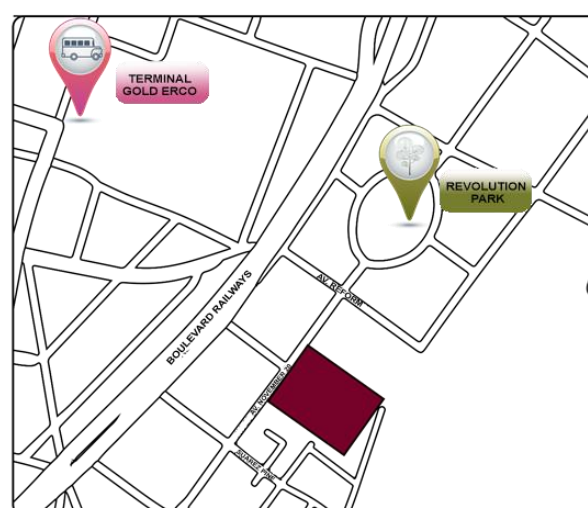


Figure 6 Micro location sketch of the location of the land at the address: Revolución, 74270 Atlixco, Puebla
Source: (Díaz, 2021).

Next, Figure 7 shows the project's operation diagram, establishing the type of public and semi-public connections, students, parents and workers, as well as authorised and service personnel. In terms of operation, a main entrance, a reception area, lobbies that allow the distribution to the different areas are considered. It should be noted that the diagnostic area, workshops and therapies with green rest areas are considered, as well as toilets, dining room, kitchen, storage and greenhouse; the latter with interior access through the lobby. For access to the auditorium, an access from inside the centre and an access from the car park are envisaged. The auditorium foyer also connects the job training area, administration and multi-purpose courts.

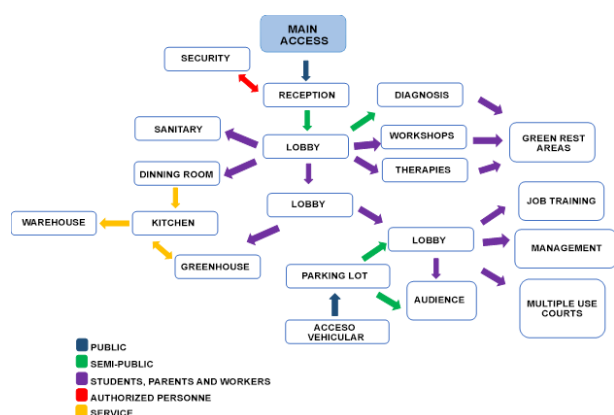


Figure 7 Diagram of operation
Source: (Díaz, 2021)

Figure 8 shows the overall plan with 5 buildings, parking, service access, court and green areas. The overall plan shows the overall plan of the project where the distribution of the buildings, auditorium, greenhouse, parking and green areas can be seen. Building 1 is composed of accesses, diagnostic area, workshops, kitchen, dining rooms, storage rooms and toilets. Building 2 is the computer rooms, storerooms and toilets. Building 3 is the administration area with offices, meeting rooms, reception, dining rooms, storerooms and toilets. Building 4. The auditorium with stage, seating area, controls, storage, waiting room and toilets. Building 5 the greenhouse with preparation and experimentation area, cultivation area and storage area. Zone 6. Parking area and student reception area 7.



Figure 8 Overall floor plan. 1 accesses, diagnosis area, workshops, kitchen, dining rooms, storage rooms and toilets. 2 computer classrooms, storerooms and toilets. 3 administration, dining rooms, storerooms and toilets. Building 4 auditorium. Building 5 greenhouse. 6 car park and 7 student reception

About the constructive part, the following characteristics of the constructive elements are established:

Building 1 for Clinics of 2 levels, where are also located waiting areas, assessment offices for people with ASD, nursing, language communication workshop, sensory stimulation workshop, motor skills workshop, cognition workshop and sociabilisation workshop; all with storage rooms and secure area, it also has a dining room and toilets with: foundation based on masonry foundations, running footings, dados, counter-foundations and reinforced concrete perimeter walls. Reinforced concrete castle structure, reinforced concrete columns and reticular slabs and expanded polystyrene block. Main façade made of anodised aluminium in colour, with 6 mm. clear national glass. Vinyl tile floors and false ceilings of plaster panels.

Building 1



Figure 9 Main façade. The interior of the social therapy room where colour theory was applied to create attractive spaces for students and the opportunity to create different environments in a single space
Source: (Díaz, 2021)

Building 1

Figure 10 socialisation workshop
Source: (Díaz, 2021)

Building 2. This building contains the digital media classroom, manual media classroom, storage rooms and toilets. Masonry foundations and red brick walls. Structure of columns, reinforced concrete castles and reticular slabs of reinforced concrete and expanded polystyrene block. Main façade of anodised aluminium in colour, with 6-millimetre national glass. Terrazzo floors, apparent glazed partition walls. - Intercommunication system. Figures 11 and 12 show the application of different modules to take advantage of the topography of the site, creating movement, the theory of colour to generate friendly environments, the placement of textures and ramps.

Building 2

Figure 11 Façade of building 2
Source: (Díaz, 2021)

Building 2

Figure 12 Façade of building 2

Building 3. Administrative offices. These include the offices of the accounting, human resources, publicity, educators and general directorates. In addition to a meeting room, dining room, toilets and storerooms. Masonry foundations and reinforced concrete perimeter walls. Reinforced concrete castle structure and reinforced concrete reticular slabs and expanded polystyrene block. Main façade of anodised aluminium in colour, with 6-millimetre national glass. Terrazzo floors, apparent glazed partition walls. Intercommunication system.

Building 3

Figure 13 Facade of building 2
Source: (Díaz, 2021)

Building 3

Figure 14 Side facade of building 2
Source: (Díaz, 2021)

Building 4 the Auditorium. It contains a waiting room, toilets, light and sound control, a stage and a room for 118 spectators. Foundations based on castles, continuous footings, dice, counter beams and perimeter walls of reinforced concrete. Reinforced concrete slab of 15 cm. of thickness. Castle structure, columns with contrabeams. Reticular slabs of reinforced concrete and expanded polystyrene block and for the spectator area tridilosa was used. Integral type main façade in color anodized aluminum, with 6-mm national glass. Terrazzo floors, apparent glazed partition walls. Intercom system.

Building 4

Figure 15 Main façade of building 2
Source: (Díaz, 2021)

Building 4

Figure 16 Main façade of building 2
Source: (Díaz, 2021)

Building 5 the Greenhouse. It is made up of a warehouse, study area and cultivation area. Foundation based on continuous footings, dice, counter beams and perimeter walls of reinforced concrete. Reinforced concrete slab of 15 cm. of thickness. Structure of columns and roof of tridilosa. Integral type main façade in color anodized aluminum, with 6-mm national glass. Terrazzo floors, apparent glazed partition walls.

- Intercom system

Building 5

Figure 17 Facade of building 2
Source: (Díaz, 2021)

Building 5

Figure 18 Façade of building 2
Source: (Díaz, 2021)

For the "Interactive centre for the development of learning for young and autistic children in Atlixco, Puebla" all the spaces were considered according to the design and construction regulations. An important element is the landscaped areas, according to the INFIED regulations, where it is established that the project must have 30% of green areas inside the property of the surface of the land. In the case of vehicular and pedestrian walkways, they will be made with permeable pavements, with an absorption of rainfall to the subsoil of at least 50% of the uncovered areas.

Conclusion

It is important to point out that inclusion for the social development of autistic children and adolescents is the starting point for the person to have a sensory development that allows him/her to live with his/her own family. Therefore, this is a relevant issue and should be addressed by universities, government and society. It was also observed in the process that being a subject known by the thesis student, it allowed a closer approach to the problem and its solution. A detailed proposal for the executive project was reached, surpassing the initial expectations of the project, and this space only shows a small part of the research and design process.

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