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APPLYING NEW CRITERIA FOR HIGHER EDUCATION CAMPUSES TO SERVE SPECIAL-NEEDS STUDENTS, CASE STUDY: AASTMT ALEXANDRIA CAMPUS

Nancy F. Darwish*[1], Adel Samy El Menshawy [2], AbdelAziz Farouk A. Mohamed[3] , Fahd A. Hemeida[4]

ABSTRACT

This research focuses on addressing the challenges faced by disabled individuals, particularly in the context of higher education buildings in Egypt. Despite the increasing percentage of disabilities in the country, many students with physical impairments are unable to join universities due to the lack of accessibility in campus buildings. The main difficulty is how to create an environment where diverse students with varying requirements, abilities, preferences, and moods can study the same curriculum simultaneously. The study aims to evaluate the accessibility of a specific campus, AASTMT, by comparing it with a successful example, Goldsmiths, University of London. The research identifies areas for improvement, outdoor elements such as outdoor obstacles, accessible parking, clear signage, easy entrances, curb ramps, pathways, and steps, and indoor elements such as insufficient accessible toilets, lifts, stairs, and fixed furniture hindering wheelchair users. The case study concludes that AASTMT is successful for 80% of the evaluated criteria. The research emphasizes the importance of implementing elements that facilitate independent movement for students with physical impairments

KEYWORDS: Physically disabled people, Campus Accessibility, Landscape, architecture design, Special -needs rights, The Egyptian code requirements elements, Egypt, Alexandria

Abbreviations:

AASTMT	Arab Academy for Science & Technology & Maritime Transport, Alexandria Campus
RHB	Richard Hoggart Building

1.INTRODUCTION.

Egypt, people with disabilities include those who have ongoing physical, mental, intellectual, or sensory impairments that, when combined with other factors, may prevent their full and effective participation in society on an equal basis with others [1]. Egypt shall ensure that the health, economic, social, cultural, recreational, sporting, and educational rights of people with disabilities are guaranteed [2]. Shall also work to increase employment opportunities for all, allot a portion of such employment opportunities to such people, and adapt public spaces and their immediate surroundings to their unique needs [3][4].

[1] *Architectural Engineering & Environmental Design Department, Arab Academy for Science, Technology and Maritime Transport (AASTMT), Alexandria, Egypt. N.Mohamed15088@student.aast.edu*
[2] *Professor at. Architectural Engineering & Environmental Design Department, Arab Academy for Science, Technology and Maritime Transport (AASTMT), Alexandria, Egypt. Email: dradelsamy@yahoo.com.*
[3]*Associate Professor at Architectural Engineering & Environmental Design Department, Arab Academy for Science, Technology and Maritime Transport (AASTMT), Heliopolis Cairo, Egypt. Email: drabdelaziz@aast.edu*
[4] *Associate Professor at Architectural Engineering & Environmental Design Department, Arab Academy for Science, Technology and Maritime Transport (AASTMT), Alexandria , Egypt. Email: fahd.omar@aast.edu*

So accessibility must be actively marketed as a shared good for everyone. It facilitates the full and effective participation of all [5]. A city is only well planned if it is planned for everyone [6].

Strong, specific commitments are necessary for this, including frameworks for urban policies that are inclusive of and accessible to people with disabilities, suitable standards and regulatory structures, "design for all" planning and design methods, and predictable budget allocation. Disability-related individuals and their organizations must also actively and meaningfully participate in all stages of the urbanization process as agents of development, and beneficiaries of development [2]. Integrated transportation services and facilities offer accessibility for all users while also being dependable and reasonably priced. Accessibility must be maintained throughout the entire chain of travel, from the starting point to the end destination, in order for inclusive transportation to be possible. An analysis of the current state of a facility that directly serves people with impairments was done ‘The most significant reason of why I chose this topic that personally experienced this struggle in life.

1.1. PROBLEM STATEMENT

The basic problem is to fix a suitable environment that makes it possible for people to live comfortably. People with disabilities often depend on others or assistive devices to move from one place to another and to interact with their surroundings [2]. Especially in high education buildings, most of physical impairment students cannot complete their education cause lack of elements that help them to depend on their selves, and suitable dimensions and ratio that make these elements to be useful and easy for them to use [7]. It is necessary to achieve an architectural technical standards level. Physical issues, mental, behavioral, mobility, hearing, visual, and psychological demands are separated from design considerations like privacy, simplicity and clarity, and ease of movement [8].

The research aims to identify the strengths and weaknesses of the Abu-Qir campus, shedding light on areas that require improvement. The primary objective of this research is to focus on the implementation of architectural and landscape techniques that cater to the needs of disabled individuals within educational campuses. Specifically, it aims to address the challenges faced by physically challenged individuals residing in Egyptian cities. Additionally, the study examines various planning and design elements of high educational buildings in Egypt, with a comparative analysis between the Goldsmiths, University of London and AAST, Alexandria Campus. Through these case study comparisons

1.2. METHODOLOGIES

The research technique is divided into three parts: descriptive, comparative, and analytical.This research is divide into two parts outdoor and indoor

- Outdoor elements are transportation, main gate, entrance, ramps, steps, handrails, parking, and signs.
- Indoor elements are building’s entrance, vertical access: stairs, handrails, elevators, platform lifts. Horizontal access: accessible routes, corridors, doors, accessible toilets, classrooms, indoor café.

2. Requirement elements for special-needs students for higher education campus

Designing a higher education campus to meet the diverse needs of special-needs students involves thoughtful consideration and implementation of various architectural elements.[9] These elements contribute to creating an inclusive and accessible environment that promotes equal opportunities for all. [10]. Here are key architectural requirements:

Accessible Infrastructure such as Ramps and Elevators, Install ramps and elevators at key locations to ensure wheelchair accessibility between different levels of buildings. Accessible Entrances: Implement automatic doors and accessible entrance designs to facilitate easy entry for individuals with mobility challenges. Adaptive Technology Spaces such as assistive Technology Labs: Designate spaces equipped with adaptive technologies, specialized software, and ergonomic furniture to support students with varying needs.[11] Universal Design Principles such as classroom design: Implement universal design principles in classrooms to accommodate diverse learning styles and mobility requirements. Flexible Furniture: Use adjustable and flexible furniture to accommodate different physical needs and ensure ease of movement. Provide Wheelchair-Accessible Restrooms with sufficient space for wheelchair maneuverability; grab bars, and accessible fixtures. Implement clear and visible signage using symbols, Braille, tactile elements, and contrasting colors to assist individuals with visual impairments. Ensure that outdoor pathways across the campus are smooth, wide, and free of obstacles to facilitate easy navigation for individuals with mobility aids. By incorporating these architectural elements, higher education campuses can proactively create an inclusive and accessible environment that fosters the success and well-being of all students, including those with special needs [12].

2.1 Successful example for higher education campus around the world is Goldsmiths, University of London.

2.1.1. Description

It was renamed Goldsmiths' College and has a focus on the humanities, social sciences, design, and arts after being acquired by the University of London in 1904. At the former location of the Royal Naval School, the RHB [13], the focal point of the campus, was constructed for the first time in 1792. Goldsmiths University is ranked 12th for communication and media studies, 15th for art and design, and in the top 50 for anthropology, sociology, and performing arts.

The Worshipful Company of Goldsmiths, founded the Goldsmiths' Technical and Recreational Institute in 1891. The Goldsmiths' Company was established in the 12th century as a guild for goldsmiths. When laying the foundation for its new Institute. The RHB, which is located in the middle of the campus now, was the original Institute's headquarters and once housed the Royal Naval School in New Cross [14].

In the 1960s, Goldsmiths saw a major growth in the number of enrolled students. In this period, Goldsmiths began to establish its credibility in the arts and social sciences fields and to offer a range of fresh teaching credentials.

2.1.2 A manual for campus mobility

Information on entering university buildings for students with mobility difficulties. The campus is fairly small, and it takes only ten minutes to travel from one end to the other. The majority of bigger structures used for instruction have step-free entryways. Although not every building can claim to be completely accessible, with a little amount of extra preparation, no one should be precluded from fully participating in Goldsmiths activities as shown in figure (2).

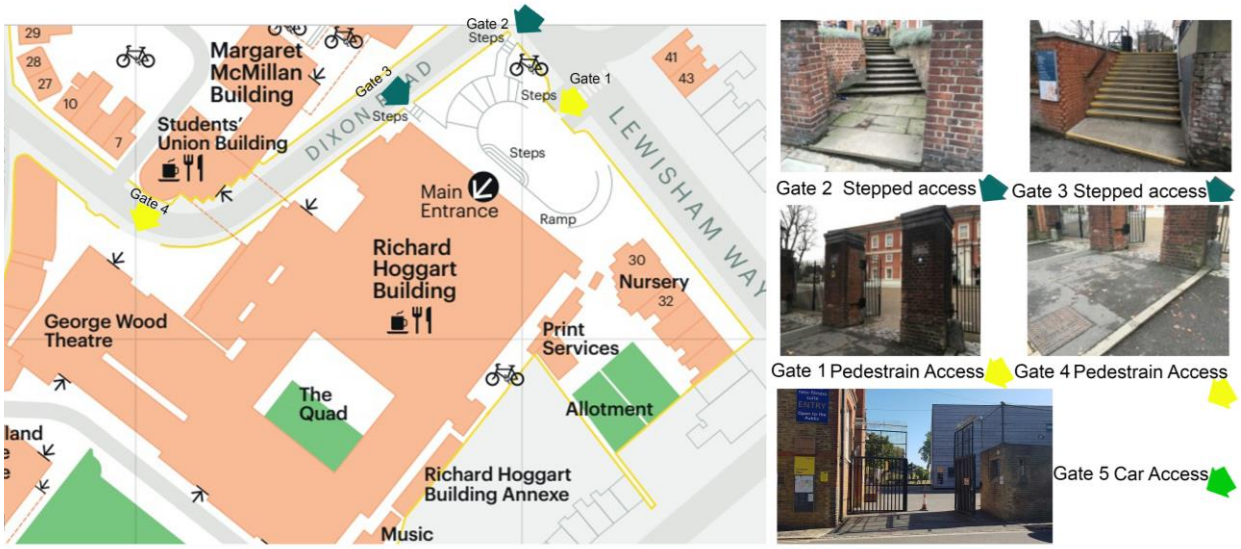

Figure (1): Main Entrance Gate [14] {15}(Edited by Author)

Figure (2): Goldsmiths, University of London Campus Map for Accessibility [16]

2.1.3. Main Entrance Gate

This information relates to the entrance on Lewisham Way that is situated in the center of the front entrance courtyard. In figure (1), this entrance has slope and stepped access. At this entrance, there is neither a canopy nor a recess that offers weather protection. There is only one door. The door is kept open all the time with opening width 170 cm.

2.1.4. Ramp

This entrance has a ramp. In front of the entryway is the ramp. The slope or ramp has a mild gradient. The ramp is always there. The top of the ramp is not a level landing.

There are no railings on the ramp. Long slopes in both directions lead to this gate on Lewisham Way. Lewisham Way and Dixon Road both lead to alternative entries into the entry courtyard [16].

2.1.5. Car Park

The RHB's back is where the parking lot is. The type of parking lot is open air. There is no height restriction barrier in the parking lot, as shown in figure (3).

Within the parking lot, there are 3 authorized parking bays. There are clearly marked Blue Badge bays. The approved parking spaces have dimensions of 350 cm by 500 cm. The allotted berths are the same size throughout. Blue Badge holders must reserve parking spots in advance. The RHB's rear entrance on the George Wood Theatre side is 15 meters away from the closest designated bay. A wheelchair user can get from the parking lot to the building with assistance. There may be a need for assistance due to the ramps. There is no tactile pavement on the lowered curb that separates the building from the parking lot. Tarmac makes up the parking lot floor.[14].

Figure (3): Accessible Car Park and Ramps in Front of Each Entrance in the Building{17} (goldsmith, university of london,

2.1.6. The Outdoor Elements for RHB:

-Entrance: The main doors open automatically. The doors are double. The width of the door opening is 132cm

-Second Door: The doors open automatically. The doors are double. The width of the door opening is 152 cm

-Ramp: The slope gradient is slight and permanent, and no handrails, located to the left as you face the entrance.

-Steps: There are 3 steps to access the entrance. There is no tactile paving at the top and bottom of the steps. The steps are not marked. The steps are medium 13 cm. The handrails are in the center of the steps as shown in figure (4)[13].

Figure (4): Main Entrance Richard Hoggart Building [13]

2.1.7. The Indoor Elements for RHB:

-Completely handicap accessible except for one or two rooms in the southwest corner
-There are accessible restrooms in both corridors and three lifts, two in the east corridor and one in the department of music corridor (ground and first floor) as shown in figure (5).[17]

2.1.8. Facilities indoor

Access
The majority of the building can be accessed without stairs by using a lift.
The far end of the left-side corridor leading to the Disability and Wellbeing Service has a high ramp with no railings for access. Figure (6) shows this change in level .
On the first floor, there are additional small ramps. The Music Department's Level is accessible from level to level by 4 clearly indicated steps without railings and with medium steps 11cm - 17cm. The steps are eliminated with a common elevator. For building areas, there is obvious signage in the reception area. At important intersections of circulation routes, there is legible printed directing signage. Some of the flooring in the hallways is shiny, which some people may find to be slippery or that could cause glare problems. Some of the flooring in the hallways has patterns or colors that some people can find confusing or mistake for steps. Good lighting conditions exist.

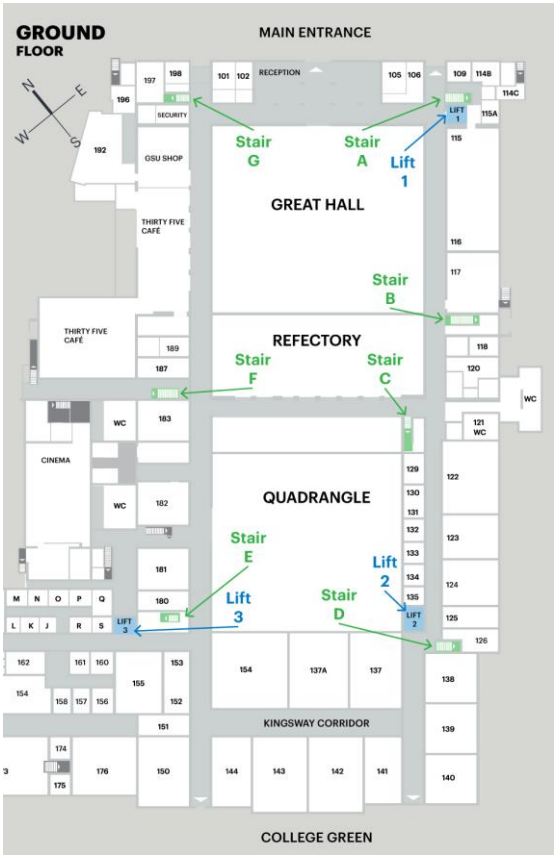

Figure (5): RHB Plan in Goldsmith, University of London. [9]

2.1.9. Eating and Drinking

There are neither fixed tables nor chairs with absence of armrest. The table is 2 meters from the café's entrance and should be at least 72 cm high. A wheelchair user has plenty of room to move. When entering Cafe from Main Corridor, a ramp is barely there and always present and has a level landing at the top and with handrails on both sides. The ramp is 113 cm wide. To access this region or

service, there are two steps on the left with medium lighting levels and have no tactile paving as shown in figure.(7)

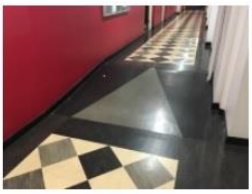

Figure (6): Access Indoor Changing in Levels By Ramps.

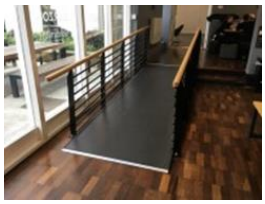

Figure (7): Eating and Drinking Cafe [13]

3.Case Study Alexandria Campus (AASTMT)

The AASTMT is the most important and successful campuses in the Arab world. The college study all departments and branches of studies. Many students apply to study in this college and from these students some of them are special need students. So by study some of problems and try to fix the help special needs to depend on their selves.

3.1. Description

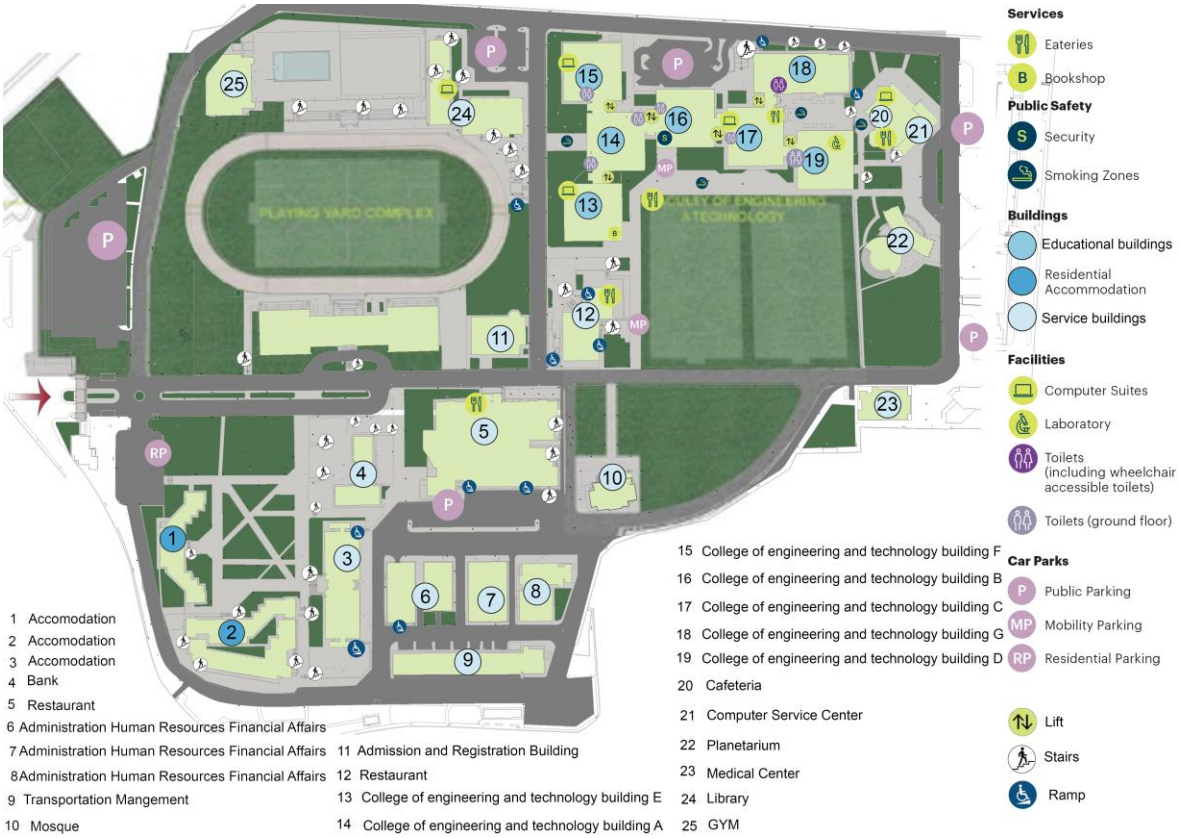

Figure (8): AASTMT Campus Map in Alexandria [18] (Edited by Author)

The Academy has been in a variety of educational, training, scientific, and community service endeavors since its founding in 1972.

The AASTMT essentially provides its services to students from all around the Arab globe as well as those from African nations because it is a multi-purpose, multi-task institution. The Academy provides instruction and training to prepare students in all areas of knowledge, including the sciences, technologies, and humanities. Through the use of methodological applications, the AASTMT has accomplished numerous educational, training, and research accomplishments in the fields of maritime transportation, engineering, and management sciences for more than 50 years. The AASTMT received the International Organization for Standardization (ISO) award, earning a spot among the top six institutions in the world for the use of standardized levels in higher education.
As shown in figure (8), the area is 52-acre land and located in El-Tarh in Abu Kir, Alexandria, as first location [19].

3.2. Getting to the campus can be by road or by bus or by train.

By road: from downtown Alexandria 52 kilos, on Toson abo-Qir road, East Alexandria, Egypt, is where Academy campus could be found. Public parking is available around the campus.
Inside the campus, there are many places to park in. By Bus: buses stop outside the campus. By Train: Toson Train Station - Arab Academy, which is around 5 minutes distant to the gate, and also easily reached by car from Academy. [20]

3.3. .Main Entrance Gate

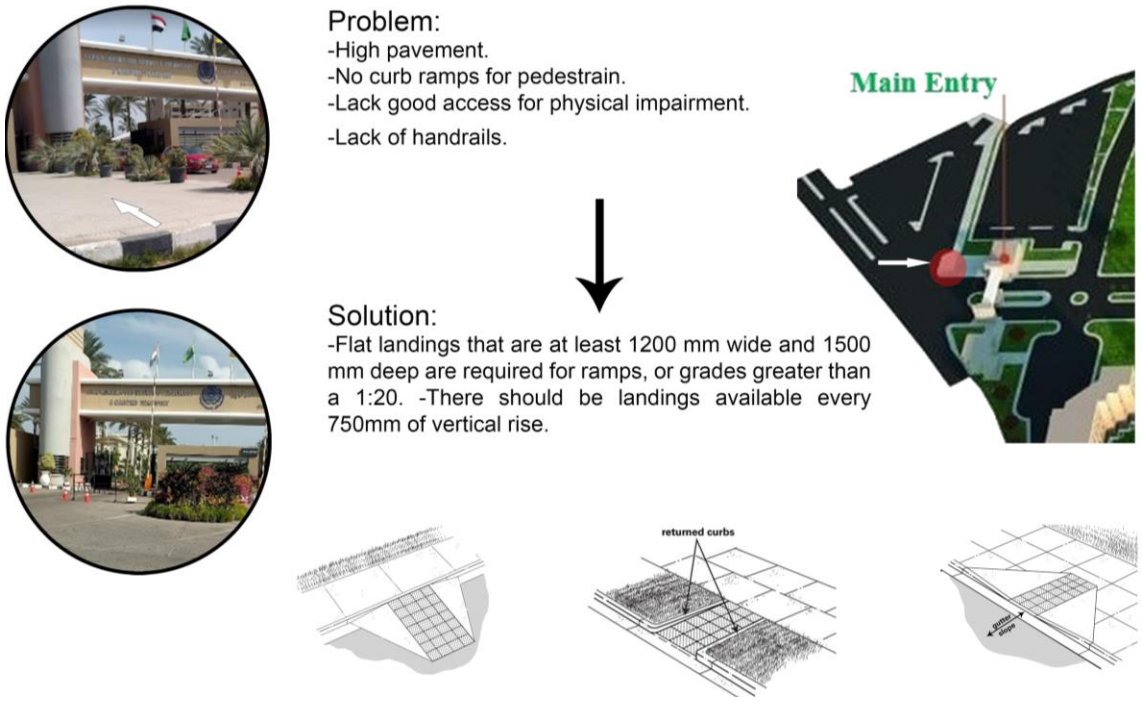

Figure (9): AASTMT's Main Entrance Gate [21][22]. (Edited by Author)

3.4. Entrance

This information relates to the entrance that is situated in the center of the front entrance courtyard. This entry has car and pedestrian access. There is no curb ramps as shown in figure (9). At this entrance, a canopy offers weather protection. There are two doors. The doors are kept open all the time with opening width 5 m for each. The width of the whole gate with the pedestrian paths is 28 m.

3.5. Vehicle Parking

The type of parking lot is open air as shown in figure (10). There is no height restriction barrier in the parking lot.
Within the parking lot, there are 7 parking bays. The approved parking spaces have dimensions of 350 cm by 500 cm. The allotted berths are the same size throughout in the whole campus. A wheelchair user can get from the parking lot to the building easily due to the ramps and accessibility. There may be a need for assistance due to the ramps. There is no tactile pavement on the lowered curb that separates the building from the parking lot.
There is bus stop inside the campus for the campus's buses and there is a garage for these private buses in the campus.

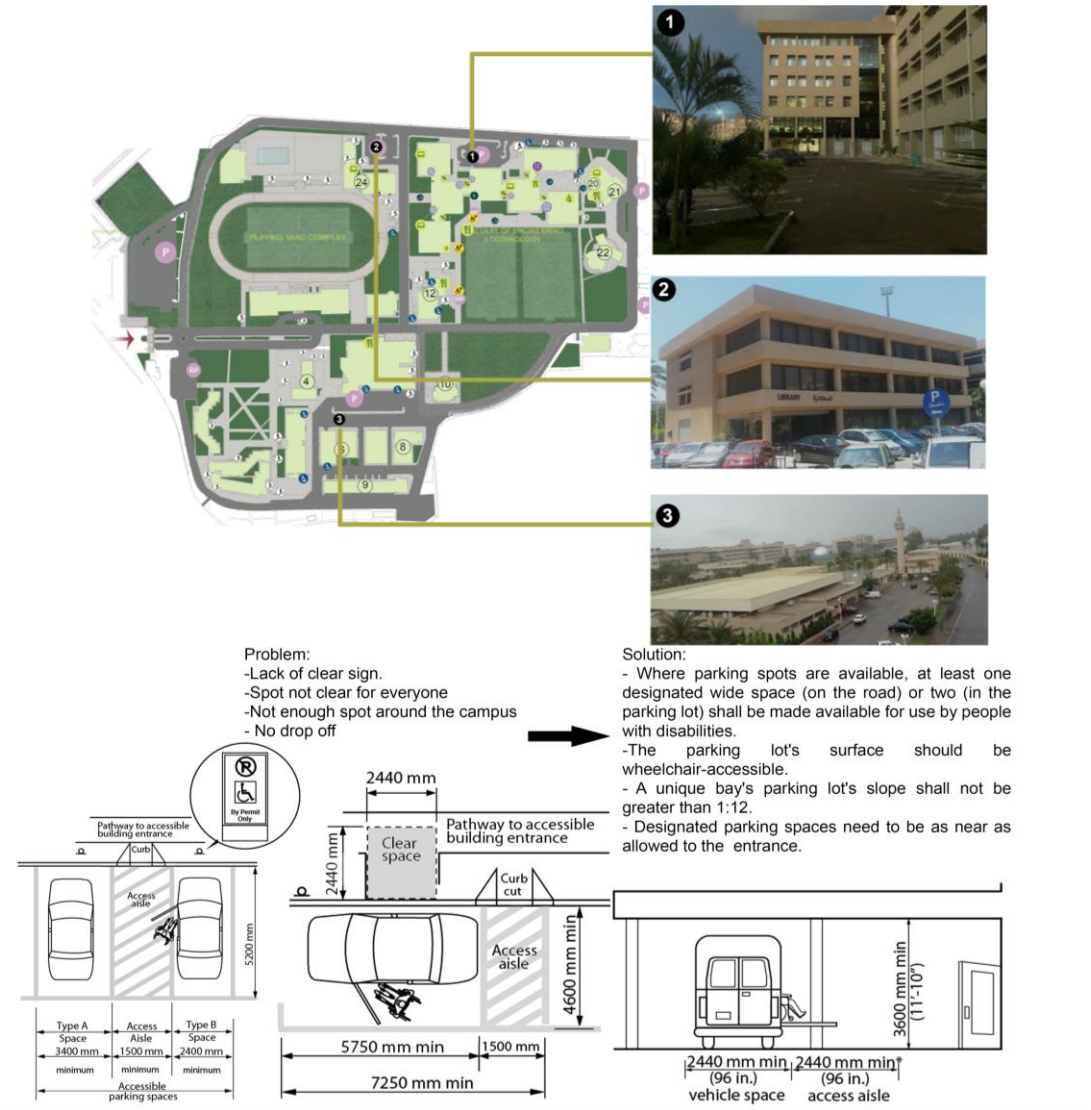

Figure (10): AASTMT's Vehicle Parking [22][23] (Edited by Author)

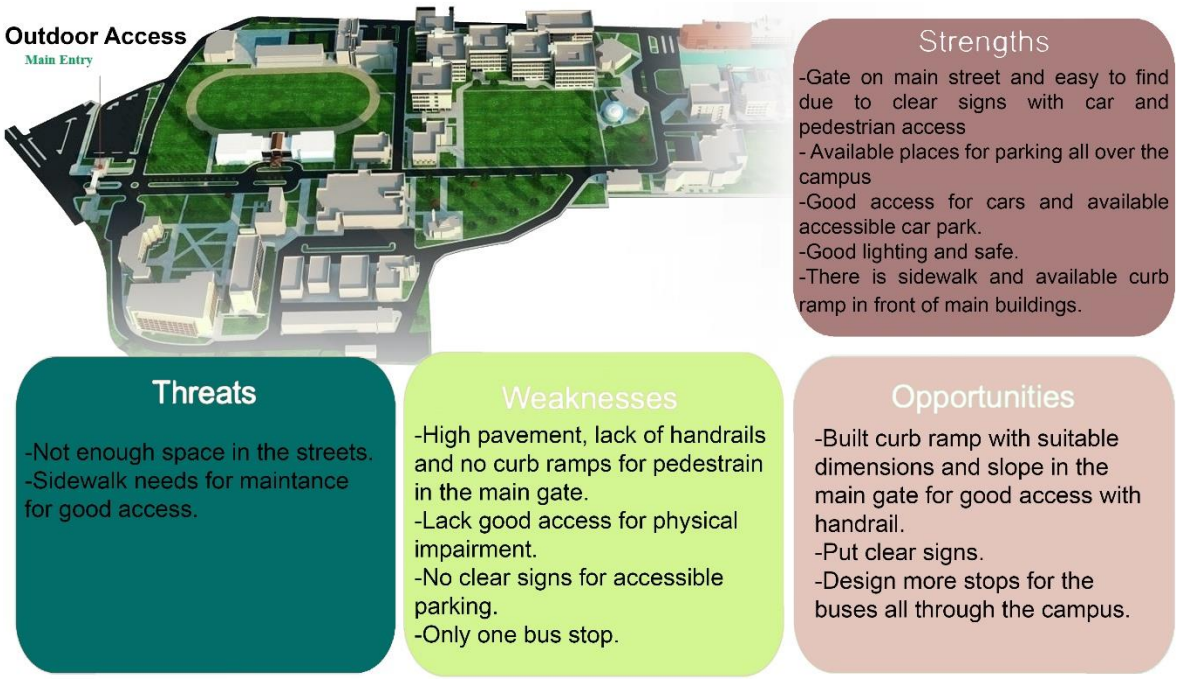

Figure (11): SWOT Analysis for AASTMT's Outdoor (Edited by Author)

3.6. College of Engineering and Technology Building

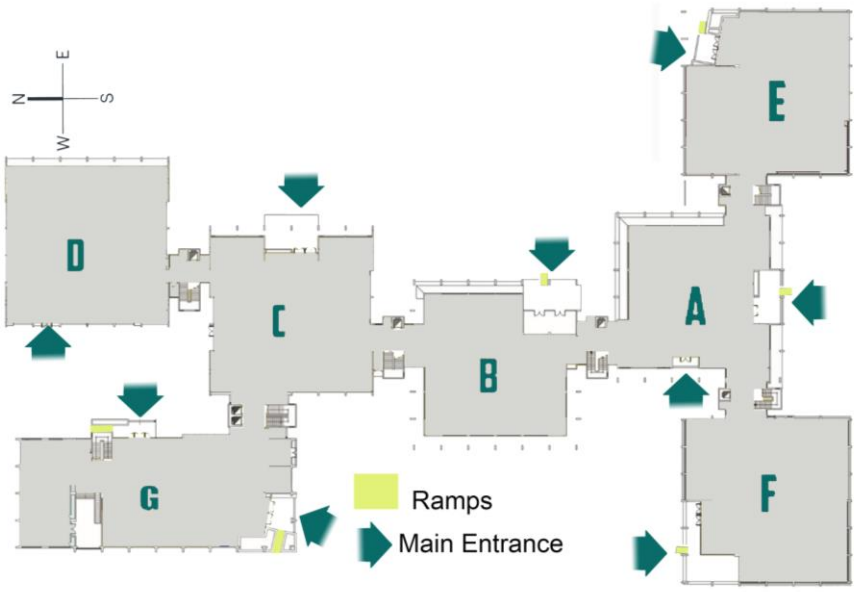

Figure (12): Building plan for entrance, ramps, and steps (By Author)

3.6.1. Entrance

There are 9 entrance doors to the building as shown in figure (12). The doors are double in number and heavy. The main doors are always open due to the working hours. The doors are double. The average width of the doors opening is 130-150 cm. The doors open up on pull way.

3.6.2. Ramp

There is a ramp in front of the door in departments A, B, C, F, and G. The grade of the ramp is minimal and permanent. The top of the ramp is not a level landing and there are no railings on the ramp except in building A, as shown in figure (12).

3.6.3. Steps

The steps are situated outside the door by 3 steps. The top and bottom of the step are not covered in tactile paving. There are indicated steps. The steps are medium-sized 14cm. There are no handrails on the stairs

3.7. Facilities indoor

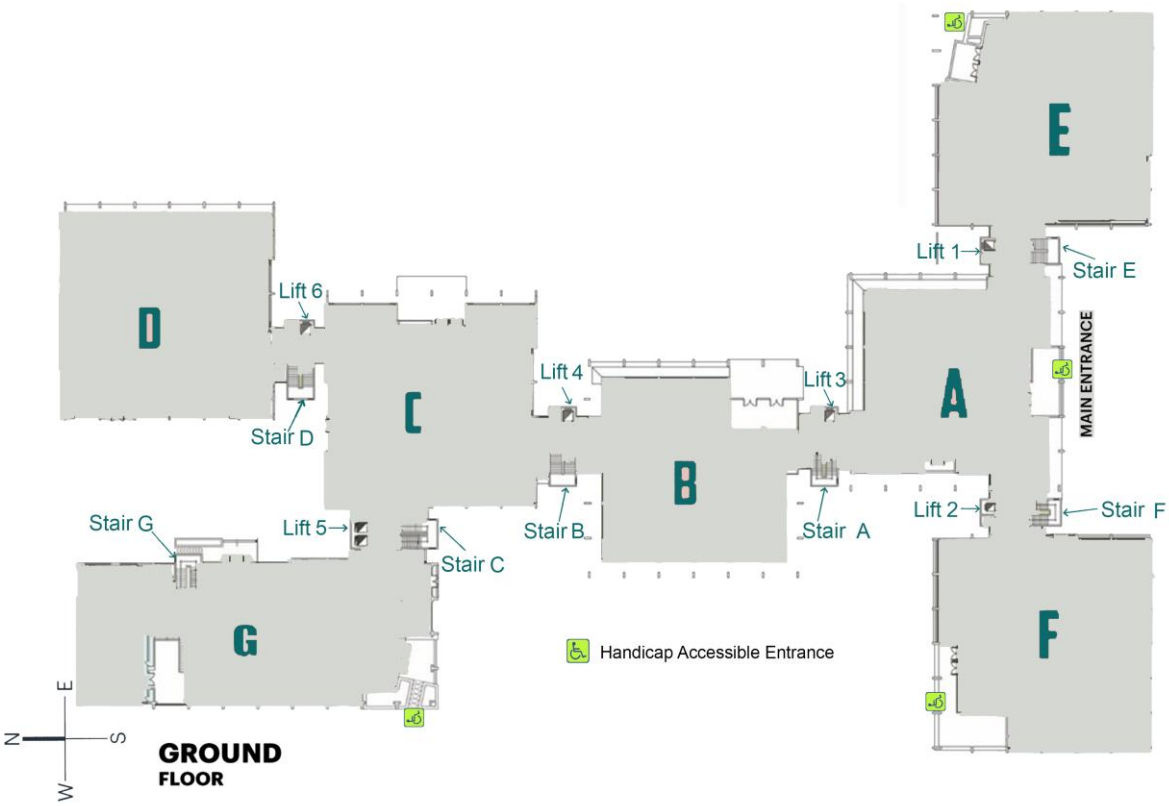

Figure (13): AASTMT's elevators (Edited by Author)

3.7.1. Access

The majority of the building can be accessed with stairs or by using a lift. The stairs are always found in front of the elevators. There are 7 stairs and 7 lifts as shown in figure (13). For building areas, there is obvious signage in the reception area.

At important intersections of circulation routes, there is legibly printed directing signage.

Some of the flooring in the hallways has patterns or colors that some people can find confusing or mistake for steps. Good lighting conditions exist.

The far end leads to the security office in building B and the security counter is in front of the entrance of the building.

The library is found on the right of the department E's entrance on the ground floor , and on the left of the entrance, there is the bookshop. There are two accessible toilets, one in section F and one in section G

One of the cafes is indoor found in department C, right at the entrance.

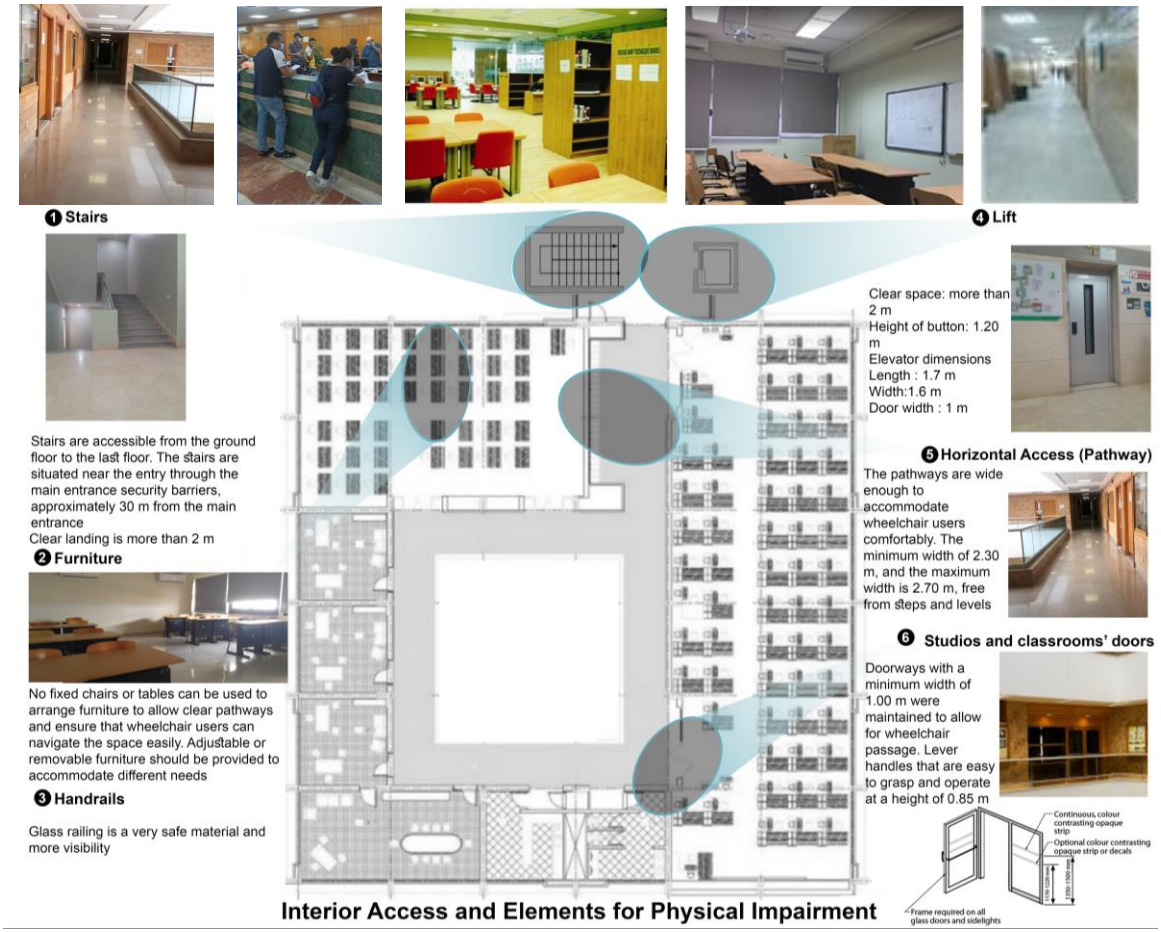

Figure (14): Indoor elements in AASTMT

3.7.2. Eating and Drinking (Cafe)

There are neither fixed tables nor chairs with the absence of armrests
The table is 1 meter from the cafe's entrance and should be at least 70 cm high.
A wheelchair user has plenty of room to move. Only the wall has menus that have legible writing and Contrast colors [20].

3.7.3. Security Office

When entering the building, on the ground floor in front of the entrance location of the security office, the desk is 4 meters from the front door. From the entryway, it is easy to see the clear signage for the reception area. The reception area has medium lighting levels. The counter is average in height 110 cm. A low area of the counter 70 cm is not accessible. Under the lowered counter, there is a visible knee recess.

3.7.4. Elevators

The general public may use the elevators.
Each department has its own lift that is found between each connection to other department.
This elevator serves the whole floors in the building. At elevator landings, wall-mounted informational boards are available.

About average 20 to 30 m separates the elevator from the main door. The clear door is 80 cm wide. The lift is 160 cm by 170 cm in average size. The mirror is present to help with reversing out of the elevator. There is a visual floor indicator in the elevator. The elevator has a medium amount of brightness. There are no Braille markings on the elevator except in the elevator in department F. The lift's controls are between 120 cm from the ground. as shown in figure (14).

3.7.5. Lecture rooms

There are neither fixed tables nor chairs with the absence of armrests in most of the chairs
A wheelchair user has plenty of room to move, The average area of classrooms is 90-120 meters square.
Some of the doors are double. The average width of the door opening is 100-120 cm. The doors open up on the pull-way, and there is obvious signage on each door

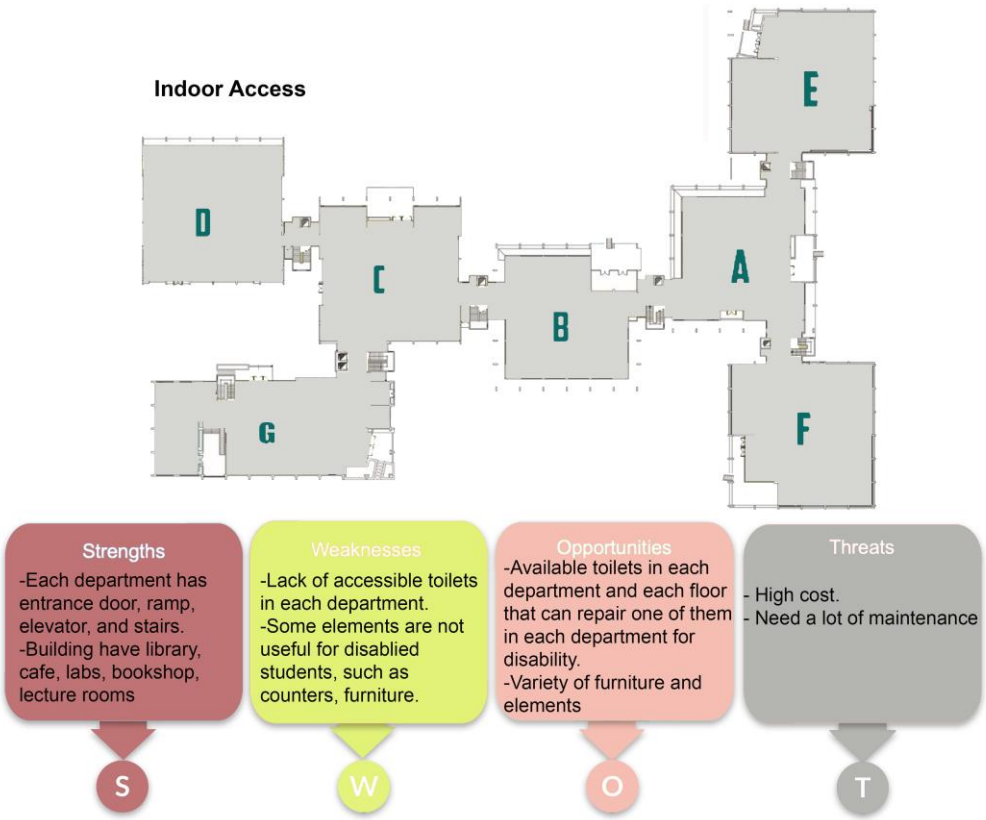

Figure (15): SWOT Analysis for AASTMT's indoor (Edited by Author)

4. Results and findings:

These checklist tables can be used to identify the areas that need to be improved. This checklist is intended as a guide for better change in architecture.

Available ●
Non Available ○

Table (1): Outdoor elements [24] (Edited by Author)

1. Outdoor elements.	AASTMT	Goldsmith
1.1.Obstacles on accessible path that refer width more than 1.2m	●	○
1.2.Designated accessible parking spaces located closest to accessible entrance with clear signage	●	●
1.4.Barrier-free unobstructed path of travel with width of 1.2m from parking area to building entrance	●	●
1.5.Present of curb ramp between parking spaces to side walk	●	●

Figure (16) Obstacles that distract the pathway access for special need

In table (1), there are the most important elements that special need students need in outdoor of the campus to move easy. There are many obstacles in the path as shown in figure (16) such as lighting fixtures, signage and step in the middle of the pavement that has width less than 1.20 m. With these obstacles in some pavement in the campus, make movement difficult for physical impairment to reach any place in campus.

There are many accessible parking around the building but not have clear space or clear signs. There are curb ramps near most of entrances as shown in figure (17).

Figure (17): Curb ramps near every entrance in AASTMT

Available ●
Non Available ○

Table (2): Building entrance access. [25] (Edited by Author)

2. Building entrance access.	AASTMT	Goldsmith
2.1. The main entrance easily seen.	●	●
2.2. Signage at all non-accessible entrances should clearly indicate location of accessible entrance.	○	○
2.3. Doorway clearance is 0.80 m when the door is in the open 90 degree position.	●	●
2.4. Corridors should be 1.10m	●	●

2.5.Available ramps	●	●
2.6.Available steps	●	●
2.7. Handrails	●	●

In table (2) explaining all elements that the building entrance access needs, As shown in figure (18), the main entrance is clear and easy to find but not all the entrances have good accessibility. Lack of signage for non-accessible entrances. All the entrance doors of the building with width more than 1 m. All of them have steps, most of entrances have ramps but not all of them have handrails.

Figure (18): Main Entrance of Engineering Building with clear doors, steps, ramp, and handrails

Table (3): Indoor elements [26] (Edited by Author)

3. Interior Building Elements	Engineering	RHB
3.1. Furniture**:** neither fixed tables nor chairs.	●	●
3.2. General and way-finding signage consistent in design and easily identifiable	●	●
3.3. Location of elevators clearly identified at main entrance. A door width of at least 0.80m.	●	●
3.4. The maximum high for the desk to reach shall be 1.20 m	●	●
3.5. Corridors should have minimum width 2 m	●	●
3.6.Two continuous handrails on both sides of steps, one at 0.9m and one at 0.7m are required	○	●
3.7.The toilets location should be visible sign indicating in accessible format	○	●
3.8.Overhead objects should have maximum height 1.30m	●	●

In table (3) explaining all elements that are inside the buildings. Most of the places have neither fixed tables nor chairs; have various furniture with suitable dimension that can be useful for user in lecture rooms, library, and cafes. There are clear signs in each room. In the engineering college building there are elevators available in each department near to the entrance. The corridors between departments have width more than 2m. There are accessible toilets in the building. The overhead shelves are higher than 1.30m as shown in figure (14)

Figure (18): Development of these two parking areas in AASTMT by designing accessible lots

The main problems of the campus is the lack of accessible parking lots with clear signage and curb ramp. these two areas in the outdoor zone of the campus are suggested to be improved by designing accessible lot parking with curb ramp and signage, due to their perfect location near the entrances of the buildings such as engineering building, café, library, and services as shown in figure (18).

5.CONCLUSIONS

This research focused on high-education buildings because a large number of students cannot complete their education due to the lack of elements in these buildings that help physically impaired students to access the building. These buildings have no criteria of dimensions, ratios, and elements for these students. Goldsmiths, University of London, is considered a good example of welcoming all types of students in their campus.

Due to the analysis of the campus outdoors from parking, gates, accessibility, ramps, and steps. There are available lots near to each building, the gate is accessible and there are ramps and steps in front of each building. For the Richard Hoggart Building, All the indoor elements are entrance, accessible, elevators, stairs, offices, toilets, and furniture in classrooms and cafes are available with suitable dimensions the students can use easily without any help. Though with these studies it seems that this campus is successful for all students with special physical impairment by 95%.

The Case Study is Arab Academy for Science & Technology & Maritime Transport Alexandria Campus was compared to the Goldsmiths University due to all the above elements outdoor and indoor in the College of Engineering and Technology Building, the result was that there weren't enough accessibility toilets, there are many obstacles outdoor and wheelchair users need help there is several halls that have fixed furniture that is not suitable for them. This case study is successful for 80%.

The evaluation of the outdoor and indoor elements at AASTMT, considering Egyptian building codes for accessibility and design standards, reveals both strengths and areas for improvement. While the campus demonstrates commendable features such as ramp with suitable ratio is 1:12, also the minimum clear width is 91.44 cm to accommodate individuals using wheelchairs and to allow space for others. Landings are required at the top and bottom of each ramp. Should be with minimum length of 152.4 cm. Ramps typically require handrails on both sides and at a height 86.36 cm. The ramp surface should be slip-resistant and stable. Avoid materials that become slippery when wet. Considerations for signs to ensure they are accessible to individuals with disabilities. Choose benches and seating with arms for individuals who may require additional support for outdoor areas. Ensure that seating is at a suitable

height for individuals using mobility aids, such as wheelchairs. The minimum width for outdoor pathway is 1.5 m. Prevent obstacles.

Indoor elements demonstrates feature such as particularly in the availability of accessible toilets with average range 1.60*2.30 with clear sign. Numbers of toilets should be available due to percentage of special-needs in the building. The horizontal and vertical circulation in building should be clear of any obstacles, easy to reach and to use. Lifts and stairs should be near the entrance. Ensuring maneuverability in spaces with fixed furniture would significantly contribute to improving the overall accessibility of the campus. By adhering to established codes and standards, AASTMT can better cater to the diverse needs of its student population and foster an environment that is truly inclusive and accessible for all. With some criteria for dimensions, ratio and fixing some elements that help students to move freely and easy in the building without help will make any building successful .

Future research

Finding suitable criteria for AAST campus that make all the buildings in this campus is welcoming all types of people especially students by finding solutions in design to be successful 100%

6.RECOMMENDATION

- Enlarge the width of the pavement to creat clear lane with 1.2 m without any obstacles
- Create accessible bays with 7 * 4.5 m with a clear accessible signage for accessibible parking
- Make sure in each intersection of street should have curb ramps with 1:20 slope and minimum 1m width, and the main gate should be easy accessible to all types of impairments to move easily
- Ensure in each entrance to any building should have suitable doors and ramps and steps.
- Provide flexible and different types of furnitures that suiable for all types of students
- Redesigning all counters in camous to contain to different heights

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تطبيق معايير جديدة للحرم الجامعي في التعليم العالي لخدمة الطلاب ذوي الاحتياجات الخاصة، دراسة حالة: حرم الأكاديمية العربية للعلوم والتكنولوجيا والنقل البحري بالإسكندرية .

نانسي فاروق درويش[5] ,عادل سامي المنشاوي, [6] عبدالعزيز فاروق عبد العزيز, [7] فهد عبد العزيز حميدة [8]

الملخص

تتناول هذه الدراسة التحديات التي يواجهها الأفراد ذوو الإعاقة، وخصوصًا في سياق مباني التعليم العالي في مصر. على الرغم من تزايد نسبة الأشخاص ذوي الإعاقة في البلاد، إلا أن العديد من الطلاب ذوي الإعاقات الحركية غير قادرين على الالتحاق بالجامعات بسبب نقص إمكانية الوصول في مباني الحرم الجامعي. تتمثل الصعوبة الرئيسية في كيفية إنشاء بيئة يمكن للطلاب المتنوعين ذوي المتطلبات والقدرات والتفضيلات والمزاجات المختلفة أن يدرسوا نفس المناهج في الوقت نفسه. تهدف الدراسة إلى تقييم إمكانية الوصول في حرم جامعي محدد، وهو الأكاديمية العربية للعلوم والتكنولوجيا والنقل البحري، من خلال مقارنته بنموذج ناجح وهو جامعة جولدسميث في لندن.

تحدد الدراسة مجالات للتحسين، بما في ذلك العناصر الخارجية مثل العقبات الخارجية، مواقف السيارات المخصصة، اللافتات الواضحة، المداخل السهلة، المنحدرات، المسارات، والدرج، والعناصر الداخلية مثل دورات المياه غير الملائمة، المصاعد، السلالم، والأثاث الثابت الذي يعيق استخدام الكراسي المتحركة. خلصت دراسة الحالة إلى أن الأكاديمية العربية للعلوم والتكنولوجيا والنقل البحري نجحت في تحقيق 80% من المعايير التي تم تقييمها. تؤكد الدراسة على أهمية تنفيذ العناصر التي تسهل الحركة المستقلة للطلاب ذوي الإعاقات الحركية.

الكلمات الدالة : *الأشخاص ذوو الإعاقة الحركية، إمكانية الوصول في الحرم الجامعي، المناظر الطبيعية، التصميم المعماري، حقوق ذوي الاحتياجات الخاصة، متطلبات الكود المصري، مصر، الإسكندرية.*

.

[5] قسم الهندسة المعمارية و التصميم البيئي, الأكاديمية العربية للعلوم والتكنولوجيا والنقل البحري - الاسكندرية N.Mohamed15088@student.aast.edu
[6] أستاذ في قسم الهندسة المعمارية و التصميم البيئي الأكاديمية العربية للعلوم و التكنولوجيا والنقل البحري – الإسكندرية .dradelsamy@yahoo.com
[7] أستاذ مساعد في قسم الهندسة المعمارية و التصميم البيئي الأكاديمية العربية للعلوم والتكنولوجيا والنقل البحرى – مصر الجديدة – القاهرة drabdelaziz@aast.edu
[8] أأستاذ مساعد في قسم الهندسة المعمارية و التصميم البيئي الاكاديمية العربية للعلوم والتكنولوجيا والنقل البحرى – الإسكندرية fahd.omar@aast.edu