

The Significance of Applying Universal Design Approach in Mosques. The Great Mosque at Aswan City, Egypt as a Case Study.

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Abstract:

In Muslim communities, **mosque** buildings have unique importance. They're also regarded as one of the city's most important structures. More religious and social activities take place in mosques, which help to determine the Islamic societies' character. The **universal design** approach "UD" expands beyond accessibility, UD regards the needs of all people of diverse abilities and ages. UD strives to achieve buildings and environments that are easily accessible and usable with dignity. This research **aims** to evaluate the **Great Mosque** under the study in accordance with the UD standards principles. Thus, enhancing the building's quality to adapt to all users. Hence, achieving universal mosques for all. The study also **targets** to raise the level of consciousness of the importance of designing mosques universally. This research depended on the analytical descriptive approach by analyzing the defects of the mosque under study, thereafter, proposing solutions to achieve an inclusive mosque. The study's **checklist** was organized to achieve the study goals. The study's **results** revealed that the Great Mosque does not sufficiently comply with the approach and principles of universal design. Ultimately, the study proposed some recommendations to achieve universally designed mosques.

Keywords:

Universal Design, The Great Mosque "Jami Masjid", Social integration, Accessibility, Quality of Life.

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1- Introduction

Disability in a specific period of the age is a characteristic of a human being. Everybody will have a permanent or temporary disability within some parts of their life. Around 15% and over a billion people of the world population live with a disability, and this number is rising increasingly [1].

Societal exclusion is a public issue that grasps the governments' attention and communities in the current period, which initiated the Egyptian government to announce that 2018 is the year of people with disabilities. Accordingly, different sectors in the country seek to achieve social integration such as disabled and older people in the entire fields of life with no discrimination [2].

One of the essential actions of non-discrimination is to provide the right for everybody to utilize diverse buildings easily, and independently. Universal design seeks to create usable, accessible, and easy buildings and environments for different ages, sizes, and abilities [3].

Accordingly, embracing a **universal design** as an approach to designing new buildings or developing existing ones is the best path to reach societal inclusion for all classes, thus, achieving a sustainable community. Applying UD standards creates safe buildings and environments that are usable, and accessible for all users, thus, improving the quality of life of all people [4].

Statement of the problem

The research problem emerges in the societal exclusion of many classes of people, which results in the hardship of transactions with the urban and built environment which includes mosque buildings visited by users several times a day.

Although a mosque is an essential place for a considerable sector of the residents, However, the design of many mosques does not accommodate all users' abilities and ages, and does not adhere to the minimum standards of disabled people as well.

Although the Great Mosque is one of the most recently constructed mosques in Aswan city. It is also accommodating a considerable number of worshipers, due to its distinguished location at the Northern entrance of Aswan city. However, the mosque does not achieve the minimum accessibility and usability requirements for worshipers and all visitors of diverse age classes and physical capabilities.

The reason for the difficulty of access and use is the lack of applying the UD approach and standards in designing the mosque. Whereas, achieving inclusiveness and community integration demands ease of movement and use of buildings by all.

Significance

The universal design approach considers the needs and capabilities of all individuals, healthy and disabled, children, the elderly, and pregnant women as well. Further, UD seeks to achieve the equality of utilizing spaces, security, and safety, easiness of access and use, and the autonomy of using spaces for all people.

In addition, this study contributes to providing a comfortable and appropriate religious environment for all worshipers, users, and visitors. The Importance of the study is evident in displaying the role of designing mosques in light of the UD approach and standards so that mosques accommodate different segments of the society. Thus, achieving social integration and improving the quality of life.

Objectives

The main target of this research is to assess the Great Mosque building in Aswan city in light of universal design requirements and its principles. Thus, improving the goodness of the building to accommodate all users. Hence, enhancing the quality of the environment of the religious buildings and achieving inclusive mosques for everyone.

Moreover, the study aims to boost awareness about the significance of applying UD standards such as those vital buildings "Mosques" to accommodate all segments of the community. To achieve the study goals, The Great Mosque "Jami Masjid" in Aswan City was selected as a case study building.

Methodology

This research relied on a number of research approaches, such as the **analytical, descriptive** approach through examination of deficiencies in the design of the Great Mosque under study, and then producing a proposal to achieve an inclusive mosque, so that accommodates all societal groups. In addition, the **applied approach** was conducted by preparing a study checklist in light of the approach of universal design for mosque buildings. A **qualitative research** study was performed by using means of a case study and the observation of the researcher based on the standards of achieving universal design in mosque buildings.

The Great Mosque was a case study building and was selected due to its distinguished location at the northern entrance of Aswan city, in addition to the mosque's considerable size, which motivates large numbers of worshipers daily, every Friday, also to

perform the feast prayers and religious occasions. Furthermore, the researcher conducted a number of periodic field visits to the mosque under study, and this was documented by photographs and the researcher's notes.

The study concentrated on **five basic features** of the inclusive mosque buildings, which are: (**Access to the building - Horizontal Circulation - Vertical Circulation - Toilets, Wet Areas, and Prayer hall/ area**).

Afterward, the proportions that express the levels of compatibility of the mosque with the universal design approach and its principles were calculated.

2- Universal design concept "UD"

There can be groups of laws that achieve **accessibility** such as the Act of Americans with Disabilities (1990), the Fair Housing Act Amendments (1988), The Act of Rehabilitation 1973, and the Architectural Barriers Act (1968), they meet the minimum requirements that protect disabled people from segregation.

Universal design "UD" approach **beyond Accessibility** in achieving equity, diversity, and usability. UD focuses on improving the built environment for all users [5]. See Figure (1)

Ronald Mac defined **Universal design** as "Creating and designing environments, services, and products to fulfil the needs of an expansive possible range of users" [6].

UD is also defined as "Designing facilities and buildings to provide accommodation for the most extensive number of users, encompassing people with visual, hearing, ability to move and other needs, like people who are shorter or taller than normal, carry luggage or push carts" [7].

A new definition of **UD** is "a process that improves human performance, well-being, health, and societal participation to enable and empower a varied population". Shortly, UD creates a friendlier, healthier, more comfortable, and easier life [8].

The approach of **UD** was established to accommodate all users' necessities in the built environment. Whereas, the standards of existing design pivot around "the physically healthy person", which prohibits accommodating multiple classes of users like people with disabilities [9].

Hence, it is essential to substitute those design criteria with other ones that take into account the divergence among people, whether they have disabilities, or are otherwise healthy.

Considering the needs and necessities of all users through the design process leads to creating buildings and built environments that are usable and suitable for the broadest range of users [10].

Hence, a group of product designers, architects, and engineers guided by Ronald Mac in 1997 prepared the **seven principles** of **UD** at the Centre of North

Carolina University, as follows [11]:

1. Equitable Use.
2. Flexibility in Use.
3. Simple and Intuitive Use.
4. Perceptible Information.
5. Tolerance for Error.
6. Low Physical Effort.
7. Size and Space for Approach and Use.

The universal design concept mentors the designers through the design process for creating inclusive buildings and environments for all people. UD also contributes to evaluating the existing designs and guides architects, consumers, and designers on the benefits of that approach [12].

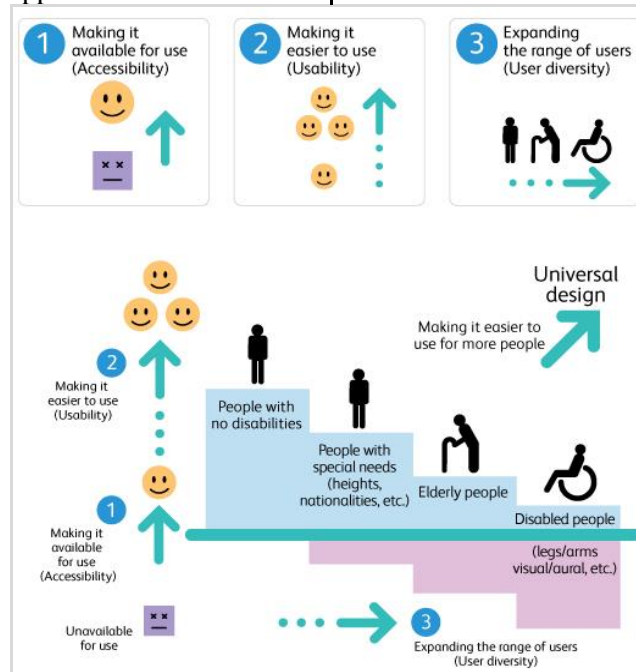


Figure (1): Shows that UD provides user diversity, usability, and accessibility for all users [13].

3- Case Study

3-1 The Great Mosque "Jami Masjid"

The term **mosque** is generated from the Arabic word "**Masjid**", indicating a place of prostration. Also, the other basic term utilized is "**Jami**", signifying congregational or Friday mosque [14].

The **Islamic definition of the mosque** is a place where praying activities occur. Further, a mosque has a particular law not only as a worship place, but also offers a socio-community activity [15].

Since the start of Islam, the institution of the mosque has played a prominent role in creating, developing, and thriving Muslim communities. Scientists worldwide have unanimously approved the importance of a mosque in the Muslims' life [16].

Moreover, mosque buildings have a special significance in Muslim societies. They are also considered one of the most important public buildings. The mosque has more social and religious activities, they shape the character of Islamic societies as well [17].

However, there is a gap between varied users' needs and the current designs of the mosques. Many of the current mosques lack to accommodate all kinds of visitors with different abilities and ages, due to the difficulty in accessing and using their different facilities.

Applying UD standards and principles in the design of mosques creates a welcoming place that is usable and convenient for the disabled, older, younger, and all individuals as well. Thus, different kinds of visitors can come and use the mosque's facility easily [18].

This study selected the **Great Mosque** which is known as "**Jami Masjid**" in Aswan city to be a case study building. The Great Mosque is a civilized façade and one of the most significant and attractive mosques in Aswan Governorate. It is located in front of the River Nile at the Northern entrance of the city of Aswan. The source of the mosque's fame is that contains the largest "Mihrab" in Egypt's mosques with an area of 100 square meters. The area of the mosque is about 6125 square meters, which accommodates more than 7000 worshippers. The mosque was opened for worshippers in 2009, and it is the most prominent one with a modern architectural character. The mosque's building comprises of three-stories, and it has an external dome 42 meters high, and the minaret is 72 meters high.

Further, the Great Mosque was chosen as the study's case due to its high value and outstanding location, also a large number of worshippers perform the five daily prayers, holidays, and religious occasions. See Figures (2), (3), (4), (5), (6), (7), and (8).



Figure (2): Shows the distinguished location of the Great Mosque and its main entrance.

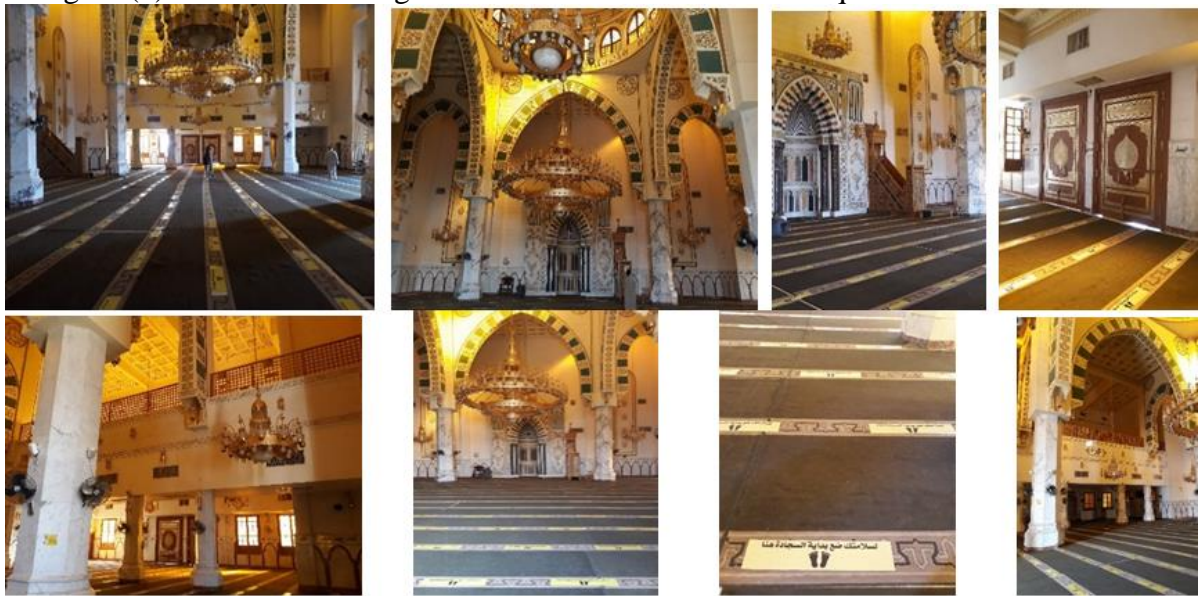


Figure (3): Shows the main prayer area and Mihrab.



Figure (4): Shows the staircase for toilets and the wet area.



Figure (5): Shows the main reading area and religious lessons for Men worshippers.

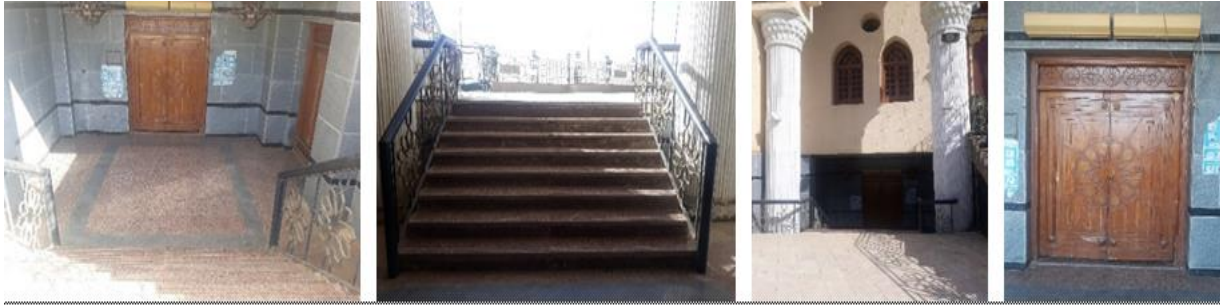


Figure (6): Shows the entrance of the Women's mosque on the basement floor.



Figure (7): Shows the prayer hall and reading area for women's worshippers.



Figure (8): Shows toilets and the wet area for the women's part of the mosque.

4- The study's checklist

The **checklist** of this study was prepared by the requirements and standards of universal design for the assessment of the Mosque under study in Aswan.

The checklist was composed of **five fundamental elements** which included 30 secondary ones inside them to achieve universally designed mosques for all people. The five essential elements were distributed as follows:

- 1) Access to the building
- 2) Horizontal Circulation
- 3) Vertical Circulation
- 4) Toilets and Wet Areas
- 5) Prayer Hall/ Area

The **assessment process** of the mosque understudy was carried out by obtaining "3 points" for each

"sub-element" if the element had fully achieved the concept of universal design, "2 points" if it was partially achieved, and "one point" if this item was not checked or unavailable in the mosque. Thus, the total number of checkpoints for the assessment elements reached 90 points. See Table (1).

The evaluation process of the mosque's building under study was carried out through field visits, researcher remarks, photographic documentation, and taking some field measurements and dimensions. Afterwards, the number of checkpoints obtained by each item was gathered about the total number of checkpoints, to get the percentage of the mosque's compliance with the universal design concept and standards.

Table (1): Shows the distribution of points for the items.

Description	Notes
▪ Fully Achieved	3
▪ Partially Achieved	2
▪ Not achieved/ Unavailable	1

5- Results and Discussion

Based on the consequences of the prepared

Table (2): Shows the extent of compatibility of the mosque elements under study with the requirements of the universal design.

No	Elements "Facilities provided"		Fully Achieved	Partially Achieved	Not achieved/ Unavailable	Remarks
	Basic	Secondary				
	Access to Building	Arrival by Motor Vehicle	**			Was provided
		Safe Crossings			**	Not provided
		Car Parking			**	No parking provided
		Path to Building			**	Not qualified for pedestrian
		Main Entrance			**	It is Clear but not qualified for all users
		Entrance Door			**	Does not pursue specifications
		Final Free Exit			**	
		Signage and Graphic Symbols			**	Signage is very poor
	Horizontal Circulation	Horizontal Circulation	**			
		Guarding Along Paths & Ramps			**	
		Doors/			**	Do not follow the specs
		Floor and Wall Surface	**			
		Terrace, and Balconies	**			
	Vertical Circulation	Ramp			**	Not Provided
		Handrail		**		only Provided for Stairs
		Stairway / Stair	**			Standard specifications
		Elevator / Lift			**	Not Supplied
		Vertical and Inclined Lifting Platform			**	
		Escalators			**	
	Toilet and wet areas	Toilet (Male & Female)	**			
		ABLUTION (M & F)	**			
		Toilet for Ambulant Disabled People			**	Not Supplied
		Wheelchair Accessible Toilet			**	
		Individual Shower Room			**	
		Ramp / Handrail			**	
		Signage			**	
	Prayer Hall/ Area	Prayer area (Male & Female)	**			
		Reading Area (M & F)	**			
		Guiding Block/Tactile			**	Not Provided
		Special Lane for PwDs			**	

checklist which were attached in tables (2) and (3), which were accomplished by the frequent observations of the Mosque under-study. The type of congregation varies, some of the worshipers were senior men, women, young people, and children. The researcher's observation was during the daily prayers and Fridays.

Table (3): Shows the degree of the compliance of the elements of the Great Mosque with the UD standards.

No	Elements "Facilities provided"		Number of Checkpoints	Total of Checkpoints
	Primary	Secondary		
	Access to Building	Arrival by Motor Vehicle	3	12
		Safe Crossings	1	
		Car Parking	1	
		Path to Building	2	
		Main Entrance	2	
		Entrance Door	1	
		Final Free Exit	1	
		Signage and Graphic Symbols	1	
	Horizontal Circulation	Horizontal Circulation	3	11
		Guarding Along Paths & Ramps	1	
		Doors	1	
		Floor and Wall Surface	3	
		Terrace, and Balconies	3	
	Vertical Circulation	Ramp	1	9
		Handrail	2	
		Stairway / Stair	3	
		Elevator / Lift	1	
		Vertical and Inclined Lifting Platform	1	
		Escalators	1	
	Toilet and wet areas	Toilet (Male & Female)	3	11
		ABLUTION (M & F)	3	
		Toilet for Ambulant Disabled People	1	
		Wheelchair Accessible Toilet	1	
		Individual Shower Room	1	
		Ramp / Handrail	1	
		Signage	1	
	Prayer Hall / Area	Prayer area (Male & Female)	3	8
		Reading Area (M & F)	3	
		Guiding Block/Tactile	1	
		Special Lane for PwDs	1	
Total				53/ 99
				53.55%

According to the results which asserted the significance of the Mosque for various residents and visitors, but, it is not convenient for all users' abilities and ages in terms of the difficulty in accessing, using, and dealing with some of its facilities.

Further, **the outcomes pointed out** that the Mosque under study does not significantly comply with the standards and requirements of the UD, it achieved 53.5% out of the standards of the universally designed mosques. See Figure (9).

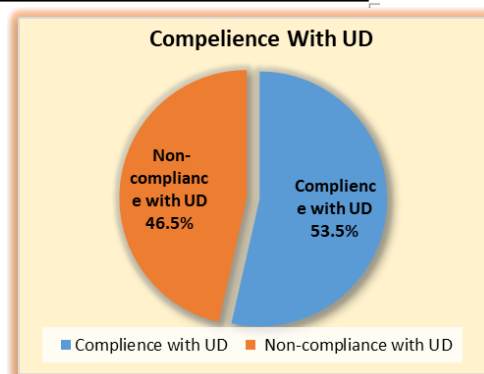


Figure (9): The overall result of the Great Mosque assessment

Depending on Figure (10) shows that (Access to the building, followed by Horizontal circulation and Wet Areas) are the basic Mosque elements that

comply with the UD approach and principles, but, (Prayer area) is the least one in compliance with UD criteria.

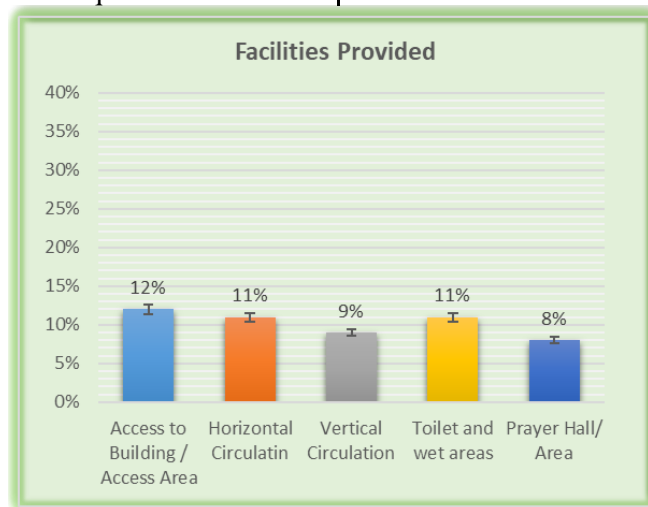


Figure (10): Percentage of the primary Mosque elements to the UD standards.

With more precise analysis, the study results revealed that despite, the Mosque building having **easy access to** reach from the main street, but, there is a major hardship to access the prayer area inside the mosque whether for men or women due to a **large** number of **grades** at the main entrance of the mosque.

Furthermore, **no car parking** is available near the mosque. As users leave their private cars in front of the main entrance of the mosque, it causes difficulties for some groups of people to enter the mosque easily.

In Aswan Grand Mosque, on one the hand, the **ablution area and toilets** are placed on the basement floor. On the other hand, the area of the prayers is on the first floor. Further, the worshippers

should use only a staircase to reach that wet area, thus it is not accessible by disabled and older people. Also, no toilet room is dedicated to the handicapped.

Moreover, the mosque lacks to provide a guiding block/ tactile, clear signage, and a special path for people with disabilities "PWDs".

The mosque does not provide an **automatic door** for ease of use. The provision of automated doors assists as a part in applying universal design principles in terms of flexibility and easy use.

Moreover, the **main entrance** is not equipped with a **ramp** for wheelchair users, which leads to isolating a large sector of worshippers that are elderly or disabled. See Figure (11)

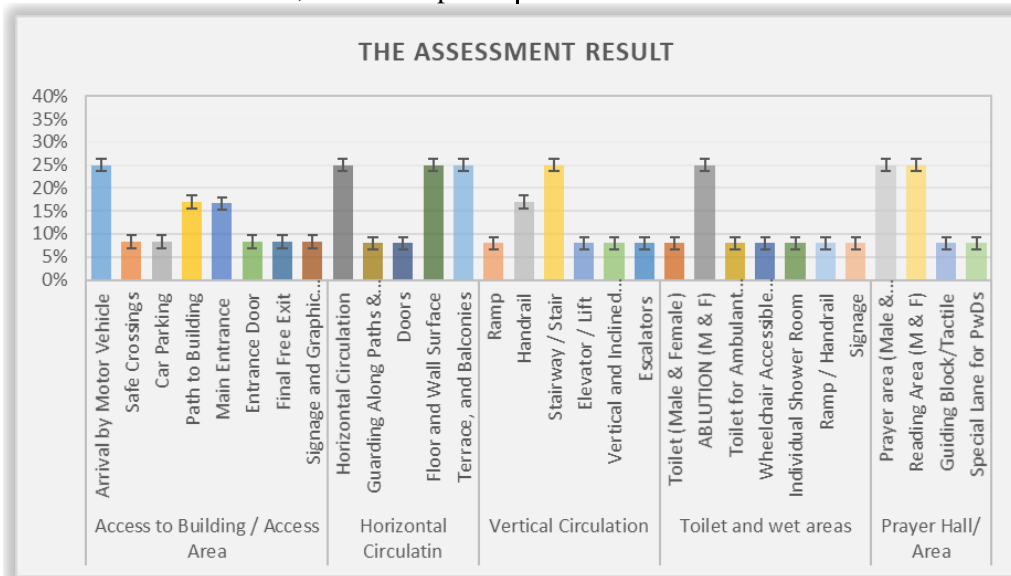


Figure (11): Detailed results showing the availability of UD requirements in Aswan's Great Mosque

6- Conclusion

This study targets to evaluate the Great Mosque

under-study in Aswan city in light of the requirements of the Universal Design Concept. The

study results pointed out that the mosque achieved 53.5% of the universal design standards for mosques. Thus, Aswan Great Mosque requires rehabilitation, and more modifications to correspond to a universal design approach and principles which provides an inclusive mosque that is suitable for all ages and abilities

In conclusion, **mosque buildings** should be **designed** by applying the requirements of the **UD** approach and its principles, consequently, mosques can accommodate all kinds of worshipers and visitors, containing people with disabilities, the elderly, and children as well. Thus, enhancing people's quality of life.

7- Recommendations

This research proposed some helpful recommendations as follows:

- The study recommends rehabilitating the mosque under study to comply with universal design standards. By focusing on dissolving the issues facing the mosque's users, such as supplying a ramp in the main entrance, providing an elevator to connect the prayer area with the toilet and wet area easily, providing doors that are easy to open for everyone, accessible car parking for users, supplying signage to guide visitors, and other problems at the mosque.
- The study proposes the establishment of an Egyptian code that accomplishes the notion of inclusiveness in such mosques' buildings and the built environment as well.
- The necessity to apply the universal design approach and its principles in the different building types, especially, religious buildings.
- Sensitizing architects, and designers of the essence of applying the approach of UD through the design process, taking into account the future modifications of buildings.
- Providing mosques with green areas which are suitable and accessible for everybody.

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