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Through Institutional Change: College Experiences for Students with Disabilities Using Universal Design for Learning (UDL)

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Abstract

This study explores the challenges faced by students with disabilities in higher education and the role of Universal Design for Learning (UDL) in creating more inclusive college environments. Students with disabilities encounter significant barriers that impact their academic performance and sense of belonging. These obstacles include faculty training, stigma surrounding disability disclosure, and limited awareness of available resources, however, this study mainly focus on accommodating students with disability in their physical space. The study employs a mixed-methods approach, combining a survey of students, faculty, and stakeholders with an analysis of architectural floor plans to identify areas for improvement in physical accessibility. The analysis of the floor plan, in accordance with the Saudi Building Code (SBC 201: Accessibility), reveals a need for improvements in restroom designs, door automation, and signage to better facilitate campus navigation. The results highlight the necessity for comprehensive institutional reforms, including thorough faculty training in inclusive teaching methods and Universal Design for Learning (UDL) principles, to create a truly

welcoming and equitable educational environment for all students. The study concludes by stressing the potential of UDL to enhance student achievement and the importance of a holistic approach to accessibility that tackles attitudinal, technological, and physical obstacles.

Keywords: UDL, Principles, Disabilities, College Experience, Students.

Introduction

The necessity of establishing inclusive learning environments is a must. The Universal Design for Learning (UDL) model, which emphasizes flexibility in how students interact with materials, demonstrate their learning, and obtain information, is a key element of this project. The main objective of UDL is to meet the unique learning needs of each student. Despite the growing awareness, students with disabilities face several challenges in higher education. These challenges are sometimes caused by the ignorance of the resources available to assist. Along with their academic performance, these challenges may impact students' self-esteem and sense of community. To create a ready learning environment, it is essential to address these fundamental problems to employ UDL strategies. This study explored the use of UDL in college settings by examining both professors' and students' perspectives and experiences.

Problem Questions

This research exploring the UDL for students with disabilities in college experiences using the following research questions:

- How can Universal Design for Learning (UDL) be institutionalized to create more welcoming and inclusive college experiences for students with disabilities?
- To what extent are faculty and staff aware of and trained in UDL principles?
- What recommendations do students with disabilities offer for creating more welcoming and inclusive learning environments?

Previous Studies

To emphasizes the importance of a holistic approach to creating inclusive educational environments for students with disabilities in higher education institutions. This comprehensive strategy extends beyond the physical accessibility to encompass a range of critical elements that facilitate the students learning. A comprehensive approach to creating a comprehensive college environment for students with disabilities encompasses various critical aspects, with physical accessibility being a primary consideration. This includes applying a variety of structural adjustments and features to ensure that all students can easily navigate through the campus independently, enabling students with mobility challenges to navigate between floors of buildings without obstacles (Von Sommoggy et al., 2020) (Pivik et al., 2002). Wide doorways and hallways are equally important, as they provide ample space for wheelchair users and those with mobility aids to maneuver comfortably. The implementation of automatic doors further enhances accessibility, reducing the physical effort required to enter and exit buildings. Additionally, the availability of accessible restrooms throughout the campus is crucial for maintaining the dignity and comfort of students with disabilities (Chiwandire & Vincent, 2017). For students with visual impairments, the incorporation of tactile paving serves as a valuable navigational aid, helping them to safely and confidently traverse the campus grounds. These physical accessibility measures, as highlighted by Pivik et al. (2002), form the foundation of an inclusive educational environment that respects and accommodates the diverse needs of all students.

Chiwandire and Vincent (2017) conducted a study in a classroom environment, focusing on thoughtful design elements such as adjustable furniture to meet various physical needs, providing sufficient space for wheelchair users to move around easily, and enhancing lighting and sound conditions to cater to different sensory

preferences. Furthermore, the incorporation of assistive technologies such as hearing loops and screen readers, plays a essential role in facilitating the learning experience in the case of auditory or visual impairments students (Anselimus, 2023). By addressing these multifaceted aspects of classroom design, institutions can create more equitable and supportive learning spaces that cater to the diverse needs of all students, ultimately fostering a more inclusive educational environment.

In classroom space, individual student needs and facilitating appropriate support measures. Students with disabilities should have access to accurate and complete class notes, which may be challenging for them to produce independently (Cushing & Kennedy, 1997), (Lewandowski et al., 2008). Extended exam time is another critical accommodation, allowing students who may require additional processing time or alternative methods of demonstrating their knowledge to complete assessments without undue stress or disadvantage. Braille or large print texts, ensures that students with visual impairments or other print disabilities can access course content on an equal footing with their peers (Nahar et al., 2015). These accommodations, when implemented effectively and consistently, contribute significantly to creating a more equitable and inclusive educational environment that empowers students with disabilities to fully participate in academic life and achieve their educational goals. Disability awareness training for faculty and staff is crucial for creating an inclusive educational environment. The training approach suggested is to cover numerous types of disabilities, such as physical, sensory, cognitive, and mental health conditions. The training should provide practical guidance on effective communication and reasonable accommodations for students with different needs (Roth et al., 2018). Faculty should be trained to incorporate universal design principles into their curriculum, benefiting all students and creating a more equitable learning environment.

Accessible campus shuttles and reserved parking spaces are crucial components of an inclusive transportation system on campus. Nevertheless, clear signage system with high contrast, Braille and tangible information, and campus maps are essential for creating a easy navigation environment for all students (Odame et al., 2020). Implement a consistent signage system throughout the campus, using large, easy-to-read fonts and strong color contrasts. In addition, establish clear procedures for requesting accommodations and conduct regular accessibility audits and improvements to maintain an inclusive campus environment. Create a streamlined process for students to request accommodations, with a dedicated office or staff member to handle these requests efficiently (Smith et al., 2019).

Institutional Welcoming and Encouraging the Learning Environment:

Many researchers explored disability studies from various angles. Kendall (2016) investigated the experiences of 13 disabled students at a UK university, where these students shared the challenges they faced and the support they received. The findings indicated that many students were reluctant to label themselves as disabled due to fear of stigma and differing treatment. Additionally, through a review, Toutain (2019) analyzed the challenges encountered by students with disabilities when seeking accommodations in higher education. In this study, many students were hesitant to disclose their disabilities, because they were concerned about how their professors and peers viewed them. Some students who highly value their independence might hesitate to ask for help. To enhance the effectiveness and accessibility of accommodations, the findings emphasize the importance of better communication between students and disability resource offices, promoting a more supportive campus environment, and raising awareness (Toutain, 2019). Teachers can build more inclusive classrooms where students flourish by combining a range of instructional strategies and technological tools such as iPads and clicker systems. According to research, students retain information better and perform more fairly

when learning is flexible and offer a variety of ways for them to participate, access information, and demonstrate their knowledge (Izzo, 2012). The encountered obstacles such as staff ignorance of particular disabilities, irregular modifications in tests, and unfavorable sentiments from certain professors (Kendall, 2016). Students believe that learning support plans (LSPs) should be more individualized and that they are too general, even though university support services are generally beneficial (Kendall, 2016). This study underlined the need for improved staff training on disability awareness and the significance of creating an inclusive environment in which students feel at ease sharing their disabilities. However, many students still faced challenges that prevented them from fully engaging in college life (Kendall, 2016).

Universal Design for Learning (UDL):

Research on Universal Design for Learning (UDL) highlights its significant impact on educational outcomes, particularly in K–12 settings. A systematic review of thirteen studies revealed a significant overall effect size of 3.56, demonstrating that UDL strategies have a positive impact on learning. Tailored methods are especially successful in certain subjects, though consistently applying them remains a challenge. Despite UDL's proven potential to create adaptable and accessible learning environments, more research is needed, particularly in diverse cultural contexts (Ok et al., 2016). A review focused on how technology supports UDL in secondary education, the review showed that most studies emphasize the principle of representation, offering multiple ways to access content. However, the other two UDL principles (engagement and action/expression) have received less attention. The study recommends more student-centered approaches and further exploration of how technology can enhance motivation and self-expression. The UDL Guidelines Version 2.2 reinforce the importance of instructional flexibility, encouraging the use of varied methods to engage learners, present information, and

allow them to demonstrate their knowledge (Carroll et al., 2019). Tools such as graphic designs and autonomy-supporting strategies expand the comprehension and motivation, hence promoting the development of self-directed learners. Additionally, extra improvement and validation of the best practices are necessary to make best use of accessibility and outcomes.

Disability Services in Higher Education:

The transition from high school to college poses unique challenges for disabled students. While K-12 institutions typically initiate support, college students usually independently manage the accommodation processes, often encountering significant obstacles. A research brief on higher education and the Americans with Disabilities Act (ADA) emphasized that genuine accessibility extends beyond legal compliance; it requires systemic efforts that combine individualized accommodations with universal design principles. Social inclusion also remains a persistent issue, as many students feel marginalized from campus life. Recommendations include stronger departmental collaboration, enhanced faculty training in inclusive teaching, and the development of robust transition programs. Similarly, a U.S. The Government Accountability Office report has noted a steady rise in the number of students disclosing disabilities, particularly mental health conditions, since 2004. However, these students continue to graduate at lower rates and struggle to secure full-time employment. Barriers include limited self-advocacy skills, unclear accommodation processes, and communication gaps between institutions. The report urged for improvements in awareness materials, clearer procedures, and proactive staff training. The COVID-19 pandemic further exposed weaknesses in existing support systems and highlighted the urgent need for better infrastructure to help students with disabilities succeed, both academically and professionally.

Research Methodologies

The purpose of this study is to investigate how welcoming and helpful college settings are for students with disabilities. The goal is to establish a conceptual framework to create a result that improves support, belonging, and accessibility in higher education. A pilot survey was conducted to verify the topic's applicability (Nieminen, 2022) and ensure that it represents a real issue that must be resolved. In addition to helping improve the final survey tool's structure and wording, positive engagement validated the significance of exploring this topic further. Afterword, the survey was conducted ethically, one hundred participants responded to the survey. Of these, 27 participants gave negative or neutral responses, while 73 participants gave positive answers, indicating that this is a meaningful issue. Students, instructors, and other academic stakeholders were represented by the participants. This research utilizes two methods, the second method was that we looked closely at Jeddah International College's architectural floor plans to see how the physical space either helps or hinders students with disabilities. We examined only one building, and identified important locations on campus, including restrooms, classrooms, hallways, and entrances, and noted which areas might make access difficult. We compared the current layout to national standards using the Saudi Building Code (SBC 201: Accessibility) as a guide. This involved examining specifications such as door widths, restroom layouts, ramp slopes, and the presence of conspicuous signage. By directly projecting these observations onto the plans, we were able to pinpoint the areas that require updating.

A structured survey was employed in this study. It was carried out online using a digital form that was disseminated to people connected to higher education through social media platforms, student WhatsApp groups, and institutional email lists. The purpose of the survey was to gather information on how students with disabilities view campus accessibility, support networks, and inclusivity. By giving participants

a thorough explanation of the study, ensuring their anonymity, that participation was entirely voluntary and risk-free, ethical considerations were upheld. The majority of participants (44%) fall within the 18–25 age range, indicating a strong representation of traditional college-aged students. Female respondents identified as (54%) compared to male (46%). Employment data shows that more than half of the respondents (55%) are currently unemployed, which aligns with the high percentage (39%) of current college students. Educationally, most participants are either still in college or have recently completed their undergraduate studies (38% with a bachelor's), with fewer holding advanced degrees (12% master's, 6% PhD). This demographic profile suggests the responses are largely reflective of young, academically engaged stakeholders from higher education as illustrated in Figure 1.

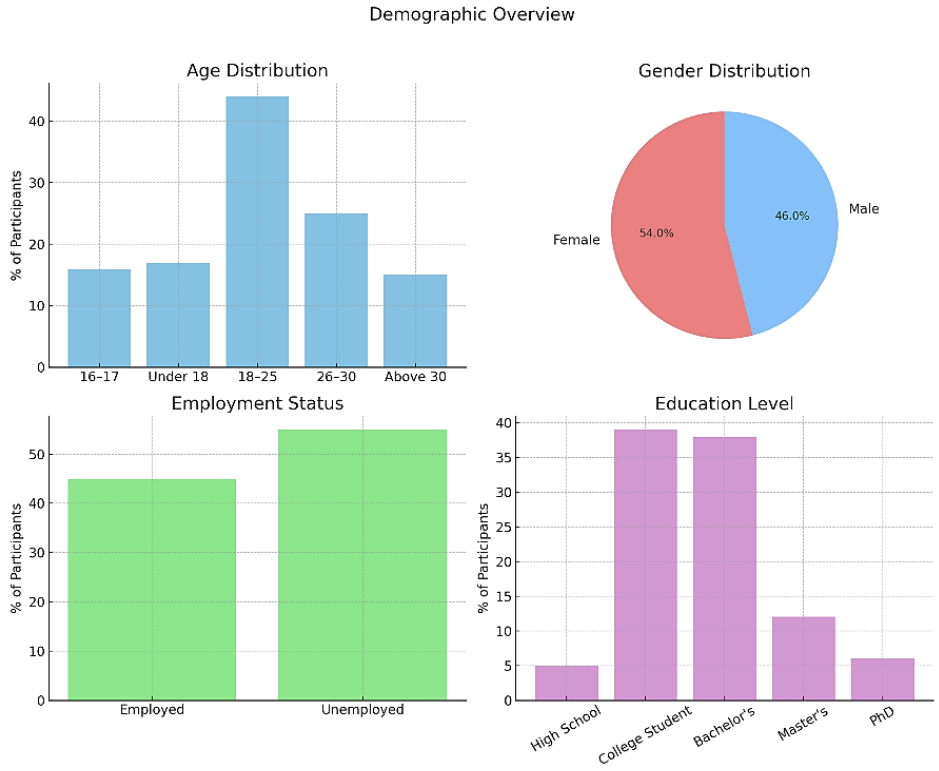

Fig. (1): This demographic profile

The survey responses show a correlation between perceptions of institutional support, physical accessibility, and transportation services. Participants who believe their university provides sufficient help are more likely to see the campus buildings, and transportation, as easy to access. However, neutral and disagreement responses across all other Likert Scale questions suggest that gaps in one area, such as mobility which may negatively influence overall satisfaction with institutional accessibility as illustrated in Figure 2.

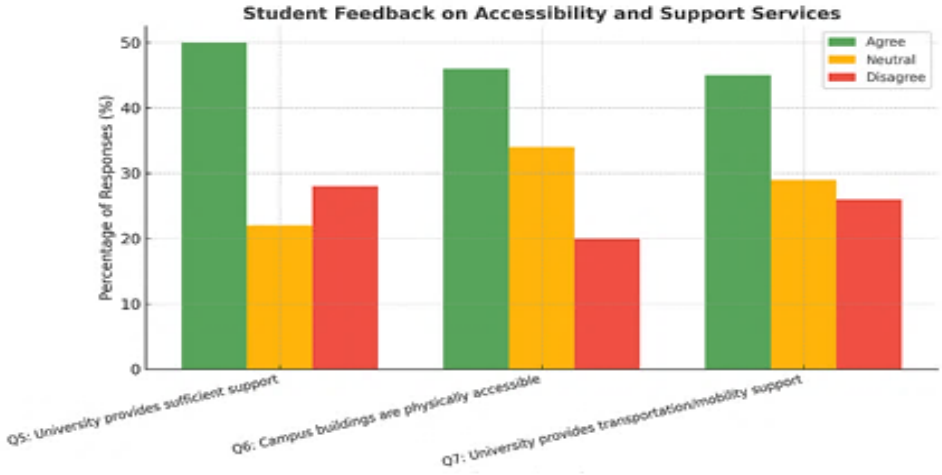

Fig. (2): Overall satisfaction with institutional accessibility

The data reveals several gaps in institutional support and inclusion efforts for students with disabilities. 43% of participants agreed that helpful technologies are functional and available, however, 57% who were neutral or disagreed highlights that there is a lack of awareness, and pointing to the need for training. Similarly, although 48% felt there is a clear process for requesting support, nearly half were uncertain or disagreed, suggesting a communication breakdown regarding rights and procedures. Inclusion in campus life appears uneven, while 48% believe students with disabilities are included in academic and extracurricular activities, 33% are unsure, and 19% disagree, indicating inconsistent experiences across different

campus settings. Lastly, only 47% believe their university promotes disability awareness, while 30% disagreed outright, underscoring a serious need for ongoing awareness campaigns and cultural competency initiatives. Overall, these figures suggest that while policies may exist, their visibility, consistency, and effectiveness remain insufficient.

Table 1 shows that there is not enough knowledge or equal access to assistive technology. This means more training, or upgrading is needed in this area. Many respondents highlighted that there is a need for better communication and visibility for the wayfinding system. In addition, many respondents do not always feel that students with disabilities are included in campus life.

Table (1): Analysis of the Survey Questions about Support for Students with Disabilities

Question Pair	What the Data Shows	What It Means
Q8 & Q9: Assistive technology vs. clear support process	Both have a high number of "Neutral" answers (32% and 28%).	Many people aren't sure if tools or help processes are available, there's a lack of visibility.
Q9 & Q11: Support process vs. awareness campaigns	Similar results in "Disagree" and "Neutral" answers (24–30%, 28–23%).	When the university doesn't promote awareness, students don't know how to get help.
Q8 & Q10: Assistive tech vs. campus inclusion	Tech may be working (43% agree), but that doesn't mean students feel fully included (48% agree, 19% disagree).	Just having tools isn't enough, they don't always lead to real inclusion in social life.
Q10 & Q11: Inclusion vs. awareness campaigns	Many say students are included (48%), but fewer think the university actively promotes that (47% agree, 30% disagree).	Inclusion might happen informally, but not clearly linked to university efforts.
Across Q8, Q9, Q10: High number of "Neutral" responses	28–33% of people chose "Neutral" a large group is unsure.	This shows confusion or lack of communication about what support exists and how to use it.

While many participants acknowledged that institutions are making efforts to support students with disabilities, the survey's results make it clear that there are still significant gaps, especially in the areas of assistive technology, accessible transportation, physical infrastructure, and inclusive practices outside of the classroom. These findings provide a solid basis for the research's next stages and will

have a direct impact on the development of results meant to make higher education more inclusive and equitable for students with disabilities.

This approach placed the difficulties mentioned in the survey in a tangible, geographical setting. We were able to see exactly where the college needed to make physical improvements, which made it simpler to envision modifications that would make the campus a more welcoming and inclusive place for all students. The second research method used in this study is a simulation and analysis of college campus. The researchers of this study analyzed the floor plan of one building in a college campus. The analysis was based on the Saudi Building Codes as follows:

Table 2 summarizes the minimum accessibility features required under various sections of the Saudi Building Code (SBC). It includes specifications for doors, restrooms, elevators, and accessible routes, ensuring that built environments accommodate users with diverse mobility needs. These provisions are essential for enhancing inclusive access and compliance in educational and public facilities. Overall, the accessible route width ensures accessible routes have a minimum clear width of 915 mm.

Table (2): Accessibility Requirements for Building Entrances, Routes, and Facilities Based on SBC Standards

Accessibility Feature	Code Requirement	SBC Reference
Entry Doors	Replace with sliding electric doors to enhance accessibility.	SBC 9.7
Restrooms	Install grab bars, ensure adequate turning space, and maintain proper door widths.	SBC 9.9.2.1
Elevators	Include audible and visual indicators and reachable controls.	SBC 9.11
Classroom Doors	Provide a minimum clear width of 810 mm.	SBC 9.7.1.1
Accessible Route Entry	Provide one accessible route from a site arrival point to an accessible entrance.	SBC 9.9.8.1
Accessible Route Level	In multilevel buildings, ensure accessible route connects entrances to public areas on the same level.	SBC 9.9.8.2
Secondary Entrance	Entrance is inaccessible, ensure secondary entrance is unlocked during hours	SBC 9.9.8.3
Accessible Route Width	Accessible routes are required to have a minimum clear width of 915 mm.	SBC 9.9.1.2

Table 3 outlines key accessibility requirements for ramps based on the Saudi Building Code (SBC). It highlights the mandated slope ratio, handrail placement criteria, and the necessity of landings to ensure safe and comfortable use for individuals with mobility impairments. These standards are critical for compliant and inclusive ramp design in public and institutional buildings.

Table (3): Accessibility Requirements for Ramps Based on SBC Standards

Accessibility Feature	Code Requirement	SBC Reference
Ramp Slope	Maximum slope of 1:12 (8.33%) for runs ≥ 0.61 meters	SBC 9.9.8.5
Ramp Handrails	Handrails required on both sides if rise exceeds 150 mm	SBC 9.9.5.2
Ramp Landings	Landings must be provided at both the top and bottom of ramps	SBC 9.9.5.5

Table 4 summarizes accessibility provisions for toilet and bathing facilities as per SBC guidelines. It emphasizes the minimum requirement for at least one accessible toilet room in any facility, along with specific design standards to ensure usability for individuals with disabilities, such as turning radius, grab bars, and fixture height regulations.

Table (4): Accessibility Requirements for Toilet and Bathing Facilities Based on SBC Standards

Accessibility Feature	Code Requirement	SBC Reference
Accessible Toilet Room	At least one accessible toilet room must be provided in any establishment where toilets are available	SBC 9.9.8.4
Toilet Room Design	Must include compliant stall dimensions, grab bars, turning space (≥ 1.5 m diameter), and correct fixture heights	SBC 9.9.2.1

Table 5 highlights the signage and wayfinding accessibility standards required under SBC section 9.1. It focuses on the inclusion of tactile and Braille elements for permanent spaces and mandates proper placement and visual contrast to support individuals with visual impairments in navigating built environments independently.

Table (5): Accessibility Requirements for Signage and Wayfinding Based on SBC Standards

Accessibility Feature	Code Requirement	SBC Reference
Signage for Permanent Rooms	Signs must include	SBC 9.1
Signage Visibility	Signs must follow	SBC 9.1

Table 6 outlines accessibility requirements for classroom and assembly seating under the SBC. It ensures that seating for wheelchair users is integrated and not segregated, and that a variety of options are available to support inclusive participation and comfort.

Table (6): Accessibility Requirements for Classroom and Assembly Seating Based on SBC Standards

Accessibility Feature	Code Requirement	SBC Reference
Integrated Accessible Seating	Accessible seating must be located within general seating areas and provide equivalent lines of sight	SBC 9.9.6.1
Varied Seating Options	Provide multiple seating and desk options to accommodate users with different physical needs	SBC 9.9.6.2

Table **7** presents the mandatory design elements for elevator accessibility. SBC guidelines require elevators to serve all users effectively by providing adequate space, multisensory controls, and appropriate reach ranges.

Table (7): Accessibility Requirements for Elevators Based on SBC Standards

Accessibility Feature	Code Requirement	SBC Reference
Accessible Elevator Design	Elevators must include a minimum cab size, reachable controls, and both visual and audible indicators	SBC 9.11.2.1

Table 8 covers the requirements for accessible parking under SBC. It mandates proximity to building entrances, clear markings, and sufficient space to accommodate individuals using mobility aids.

Table (8): Accessibility Requirements for Parking Based on SBC Standards

Accessibility Feature	Code Requirement	SBC Reference
Accessible Parking Allocation	A minimum number of accessible spaces must be located near accessible entrances	SBC 9.4.1.1
Parking Space Dimensions	Each space must be clearly marked and include a minimum 1.5-meter-wide access aisle	SBC 9.4.3

Table 9 identifies minimum circulation and turning space requirements in compliance with SBC. These specifications are crucial to ensuring that users particularly those with mobility impairments can navigate spaces independently and safely.

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Table (9): Accessibility Requirements for Circulation and Turning Space Based on SBC Standards

Accessibility Feature	Code Requirement	SBC Reference
Circulation and Turning Areas	Clear floor space must allow for unimpeded movement and turning, supporting maneuverability for users	SBC 9.3.2.1

Based on the Saudi building code, the analysis of the campus building revealed the following: i) Numerous doors were not automated, ii) some doors were too narrow for accessibility, iii) the restrooms lacked essential features like grab bars and turning space. These problems show how fundamental changes are required to better assist students with disabilities. According to the floor plan review Figure 3, the suggested points are as follows:

1. Replace entry doors with sliding electric doors for ease of access (SBC 9.7).
2. Install proper grab bars, turning space, and door widths in restrooms (SBC 9.9.2.1).
3. Ensure elevators meet SBC 9.11 (audible/visual indicators and reachable controls).
4. Classroom doors must have a minimum clear width of 810 mm (SBC 9.7.1.1).

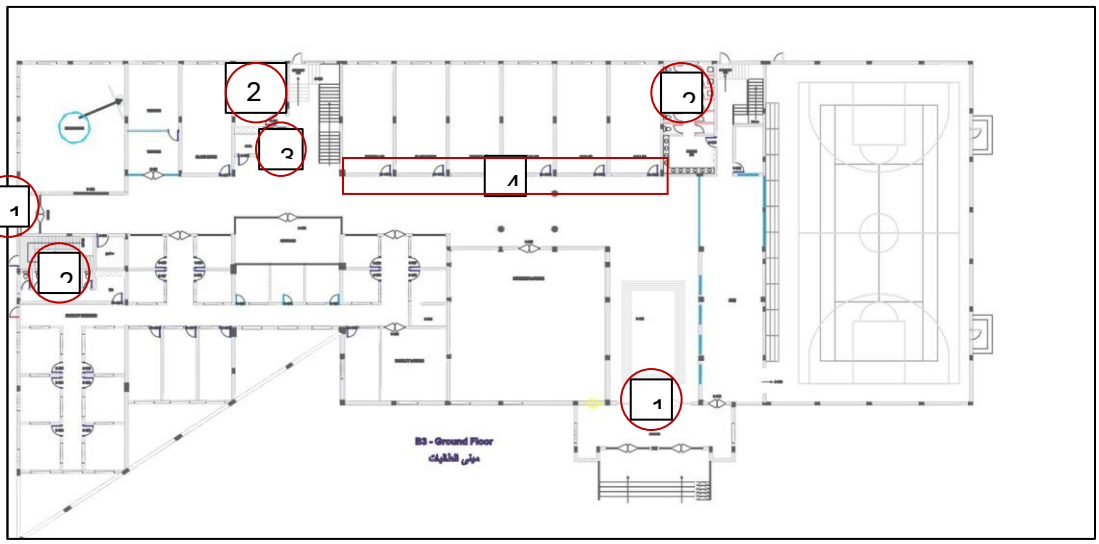

Fig. (3): Floorplan improvements

Creating a physically accessible campus is essential for enabling students with disabilities to fully engage in academic and social life. A study on campus landscapes emphasized the need to eliminate physical barriers, such as inaccessible transportation and inadequate signage, and to apply Universal Design principles. These efforts foster a sense of safety, independence, and participation for all students, including those with nonverbal communication needs. Another study assessed university buildings in Ghana and found that although many structures met about 50% of accessibility requirements, none were fully compliant. Administrative offices were typically the most accessible. The study attributed limited compliance to poor planning, a lack of awareness, insufficient funding, and weak regulatory enforcement. To address these issues, it recommended infrastructure assessments, building renovations, and inclusive design training for students in the built environment disciplines. In addition to these findings, two research methods were applied to study accessibility at JIC College. The first involved a survey collecting both qualitative and quantitative data from students with disabilities, revealing areas of success and deficiency in campus inclusivity. The second method analyzed the college's architectural floor plans against the Saudi Building Code (SBC 201: Accessibility). This comparison identified key problem areas, such as restroom layouts, ramp gradients, and signage, helping to visualize necessary changes. Together, these methods provided a clear picture of how physical spaces impact disabled students and guided targeted improvements to support a more inclusive educational environment.

Conclusion

The study highlights that while inclusive practices and Universal Design for Learning (UDL) offer tremendous potential to make higher education more accessible for students with disabilities, significant challenges still remain. These include institutional barriers, reluctance from some faculty members, the stigma that

can come with disclosing a disability, and a general lack of awareness about available resources and accommodations. To create a campus environment where all students feel supported and included, it's essential to invest in better faculty training and to foster more positive, open attitudes toward UDL. Meaningful institutional change with the support of faculty is key to building learning experiences that are not only accessible but equitable for everyone.

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