

## Article

# Towards a Better Interior Design for the Academic Library at College of Education—King Faisal University

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**Abstract:** Academic libraries include college and university libraries. Interior design is an important way to bring about the required change in transforming academic libraries from a repository of books into places for research and communication. While interior design plays a major role in providing an innovative functional design in academic libraries within universities, the problem of the study lies in the importance of academic libraries and their main role in university education institutions in encouraging and supporting scientific research among students and faculty members. According to the role of interior design in designing academic libraries, the researcher finds that there are problems with interior design in the academic library at the College of Education. It needs to be re-designed to improve functionality and aesthetics and enhance the internal space for users to achieve effective use of the internal library space. The study aims to create a better design of interior environments in academic libraries in order to feature creativity and innovation. The research method is descriptive–analytical to describe and analyze the current interior design of the academic library at the College of Education at King Faisal University and collect real information about the library and the problems of interior design. Then, it was presented through the opinion poll tool to the beneficiaries to know their opinions about the current design of the library and to benefit from them in the design proposal of the academic library according to the correct design considerations. Then, the opinion poll tool was displayed again according to the design proposal to know the views of the beneficiaries again to contribute to providing an appropriate research environment for students and faculty members.

**Keywords:** interior design for libraries; library buildings; academic library; university libraries



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## 1. Introduction

The academic library is an integral part of the formal education system which provides time-bound education from primary school level to university level. An academic library works as a base for teaching, learning, research, etc.

In addition, it is an essential part of higher education institutions (universities, colleges, and institutes) and is one of the cultural institutions having an important scientific role in supporting curricula according to different disciplines and supporting research by undergraduates, graduate students, and faculty members; this role is no less important and necessary than any other role that can be played by any other scientific institution.

Academic libraries are an important part of their academic institution, and the vision, mission, and goals of the academic library are linked depending on their academic institution's mission, vision, and goals. The academic library is a basic supporter of the academic and research needs of faculty members and students [1].

Academic libraries are considered sources of knowledge and research that create opportunities for learning and research for students. It is necessary to know the needs of the users of academic libraries so that the academic library can provide these services efficiently to its users and increase users' satisfaction through quality management.

In addition, the design standards for academic libraries in higher education institutions are directed towards advancing their role in providing suitable places for learning

and research and achieving the university institution's missions. In addition, they are directed towards the continuous improvement in the internal space of libraries in design and functionality in proportion to their area to be suitable for students' study and learning as a common work and learning space [2]. The role of interior design in academic libraries is an important role by establishing proper planning for the internal departments of the library according to their functions through a functional and aesthetic design that fulfills the requirements of the internal space of the library and is commensurate with the requirements of the users, students, and faculty members. The interior design is based on the foundations of standards for designing academic libraries in universities; planning, designing, and renovating academic libraries involve many design criteria for the needs of users in the library. The development of the traditional design of the academic library starts with reshaping gathering, studying, and reading spaces into more collaborative and tech-enriched spaces by re-planning the reading and study seating units into a design conducive to collaborative learning. The design is the most important part of the academic library as it can affect the users; it must be attractive aesthetically, suitable, and functional to attract the patrons to come to the library. In addition to the flexibility, the library's interior design must be more suitable to be applied to the academic library nowadays due to the new technological discoveries.

When planning the academic library space, it should have a variety of spaces to suit all the diverse needs of students, as the needs of the individual student differ from the needs of groups according to some of the activities in which the students participate. Four different types of space must be planned within the academic library: spaces of collaboration, sanctuary, interaction, and community. These four spaces provide students with diverse environments that suit their needs during their different times.

## 2. Literature Review

There are many recent literature reviews in the field of academic library space design. This study will review several studies that have benefited from its most prominent features. The researcher would like to point out that the studies that will be reviewed came in the period between 2002 and 2018 and included several countries, which indicates their temporal and geographical diversity.

In the following, we present a presentation of these studies; then, we explain what the current study offers by identifying the difference between the current study from the previous studies; and finally, we explore the aspects of benefiting from previous studies in the current study.

Rizzo (2002) provides some useful tips for four types of spaces: highly active and engaging shared spaces; interactive, collaborative spaces for teamwork or individual work; quieter spaces such as reading and study rooms; and places for contemplation out of the way for quiet and deep thought. According to the researcher, a good and successful academic library design would be by achieving a design balance between these four types of internal spaces for the library and to be characterized by design flexibility according to the needs of users, whether at exam times or group collaboration spaces that suit a larger number of students while working on a group project [3].

Beard and Dale (2010) provide five categories of different user spaces based on researchers' observations of UK higher education institutional libraries. They are individual information gathering, group collaborative work in open space, silent individual study, small-group collaborative work, and teaching and structured learning. Each of the five categories is designed to support an educational focus. The researchers suggested that applying learning points from others innovatively and flexibly, keeping in mind its own needs, can be a good library design [4].

Cunningham (2012) provides a scheme useful in clarifying the needs of users to be taken into account in the design of the library space that architects can benefit from and use. This schema consists of four levels: the lowest level of the pyramid refers to access and connections (including location, zones, collection, information, and network), the next level

is used and activities (including reading, writing, collaborating, furniture, and tools), and the next level is sociability (which includes communal, social, quiet, noisy, independent, and group). The higher level of the pyramid refers to comfort and image (which includes the ambiance and sense of scholarship) indicates the highest-level attribute of comfort and feel for an ideal learning space [5].

Jochumsen et al. (2012) propose a four-space model that has been used in public libraries in Nordic countries. It provides the desired outcome of library spaces at a conceptual level. The four are inspiration space; learning space; meeting space, and performative space. "The four spaces are not to be seen as concrete 'rooms' in a physical sense, but rather as possibilities that can be fulfilled both in the physical library and in cyberspace. In an ideal library, these four spaces will support each other, and thereby support the library's objectives." According to the model, the library's overall objective is to support four goals: experience; involvement; empowerment, and innovation. These could also be overlapping functions that interact in the library space physically and virtually [6].

Narum (2013) presents a proposal consisting of four questions to be considered when designing future learning spaces. The first question is, what do we want learners to become? The second question is, what are the experiences for this to happen? The third question is, what are the spaces that enable these experiences? The fourth question, how do we know? The researcher suggested focusing on the idea of transformation so that it would be easier to see how investments in physical spaces made a difference in how students experience learning. These questions are not directly related to libraries but are closely related to the mission of academic libraries in supporting the design of learning and research spaces for learners [7].

Clugston (2013) provides the interior designer's perspective on the principles of new library design. The library's interior design should include flexible and multifunctional spaces that can be permanently rearranged to suit the different functions within the library ensuring efficient use of the interior space. The design of the spaces must also be commensurate with different learning styles and needs in addition to providing sufficient spaces that ensure comfort for learners and are commensurate with their numbers, providing them with cooperative and social spaces that suit the needs of learners, and providing information in clear and direct communication [8].

Ling, Fan, and Boya (2018) provide the importance of the role of physical academic library facilities and their internal impact on library space and readership attraction. Since academic libraries are part of higher education activities, researchers have empirically analyzed the importance of various library design features that help enhance student learning satisfaction. They found that the lighting environment, the acoustic environment, as well as the location of the library building were the main determinants that influenced the use of the university library by students in a major university in China, and they made their suggestions for modifying the design of the university library: a library to suit the educational needs of students, rebuilding the standing and function of university libraries in the age of digital information and transforming them from a provider of reference material into actual spaces for learning on campus [9].

McCabe, JP (2003) stresses the importance of studying the psychological effects of color. Additionally, what is caused by dark colors and bright colors, and emphasizes the necessity of adopting a contemporary approach in choosing the colors and materials used in the design of libraries to create an attractive, friendly, and stimulating image for the beneficiaries. Colors should be combined selectively and based on a neutral background, color may appear on elements such as selected walls and partitions, and the choice of fabric for furniture, colors, and finishes should be appropriately chosen to enhance the attractiveness of the spaces for the specific age group of the user while harmonizing seamlessly with the overall concept of the space as an attractive and stimulating place to visit [10].

By reviewing literature reviews, we note that the current study agrees with previous studies on the main topic and its general objective is that it differs from it in several aspects that this study seeks to address, namely:

- The research problem included the actual reality of the interior design of the academic library at the College of Education at King Faisal University from the point of view of the beneficiaries of the faculty members and students.
- This study used the descriptive-analytical method in collecting real information about the library and the problems of the interior design of its interior space.
- An opinion poll tool was used by one sample of faculty and students to collect accurate information and opinions about the current interior design of the library from the point of view of the beneficiaries to know their opinions and needs to take them into account and to benefit from them in the development of and improvement in the academic library.
- The researcher presented a proposal for the modern interior design of the academic library that is designed by the needs of the beneficiaries and fits with the requirements of the times while solving the design problems existing in the current design and benefiting from the views of the beneficiaries to meet their needs and aspirations.
- The researcher used the second opinion poll tool for the same sample of faculty members to view the interior design proposed by the researcher for the academic library to reveal their opinions and responses.
- The researcher benefited from previous studies on the points related to the design standards of libraries and the instructions for dividing the internal spaces in the library to achieve the effective use of the internal space and design flexibility according to the levels of the beneficiaries' needs and their internal activities that must be taken into account in the design of the library space.


### 3. Problem Statement

The problem of the study lies in the importance of academic libraries and their main role in university education institutions in encouraging and supporting scientific research among students and faculty members. According to the role of interior design in designing academic libraries, the researcher finds that there are problems with interior design in the academic library at the College of Education at King Faisal University. It needs to be re-designed to improve functionality and aesthetics and enhance the internal space for users to achieve effective use of the internal library space.

Design problems of the current interior design of the academic library:






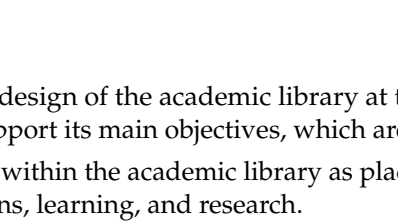
The researcher will display a set of current pictures of the academic library that illustrate the design problems in it shown in Table 1.

**Table 1.** The problems of interior design in the academic library.

No.	Problems	Figures
1.	<p>-The need for more items of furniture and interior equipment, such as reception desk, shelves, and computers, according to the number of users and internal departments.</p> <p>-The internal lighting is not commensurate with the library space, which affects the efficiency of the internal use of the library by users.</p>	



**Table 1.** *Cont.*

No.	Problems	Figures
2.	-Failure to exploit the internal space of the library with the optimal distribution of used furniture units and their diversity in proportion to the internal activities.	
3.	-The current interior design of the academic library is not an attractive learning environment for students. -The dimensions of the used book storage units are not suitable as they are huge and have great depth and were not used in an optimal functional way.	
4.	-The internal space of the academic library, in its current form, does not fit design and functionality with the needs of the beneficiaries. -The furniture used is heavy and not flexible or easy to move.	
5.	-The use of heavyweight wooden partitions in the internal division affects the narrowness of the internal space and the movement paths according to the services provided within the library.	
6.	-The lack of proportional wooden vertical dividers in dividing the interior spaces of the library functionally and aesthetically.	
7.	-There is no visual contact between users or a sense of familiarity due to the solid wood vertical partitions.	

#### 4. Study Objectives

The current study aims to develop the interior design of the academic library at the College of Education at King Faisal University to support its main objectives, which are:

- The research aims to provide the needs of users within the academic library as places for collections and places for reading, discussions, learning, and research.
- Providing a stimulating interior design environment for graduate students, faculty members, or undergraduates for scientific research.
- Achieving the design standards of the academic library functionally and aesthetically to achieve the functional requirements.
- Providing research educational resources for graduate students, faculty members, or undergraduates.

## 5. The Importance of Study

- The importance of the study is due to the importance of the topic it raises about academic libraries and their role in encouraging and supporting scientific research among students and faculty members.
- Academic libraries are the center of academic activities, providing many services to their students and faculty members to facilitate the teaching, learning, and research process.
- Providing a modern and comprehensive set of information sources that are closely related to the academic curricula, academic programs, and scientific research conducted at the university.
- Efficient interior design plays a major role in the design of the library's interior space and has a significant role in the efficient use of the library by users.

## 6. Study Limits

- Time Limits: The second semester of the academic year 2021–2022.
- Human limits: Faculty members, undergraduate, and graduate students of King Faisal University.
- Spatial Limits: Academic Library College of Education at King Faisal University.
- Subject Limits: Developing the interior design of the academic library at the College of Education in student departments at King Faisal University to support its main objectives of providing an appropriate and effective research environment for users.

## 7. Study Questions

The research seeks to answer the following research questions:

- What are the necessary design standards for designing academic libraries in universities?
- What is the reality of the academic library at the College of Education at King Faisal University in the shade of the design standards that need to be developed?
- What is the proposed vision for designing a better interior environment in the academic library at the College of Education at King Faisal University in light of the necessary design standards?

## 8. Materials and Methods

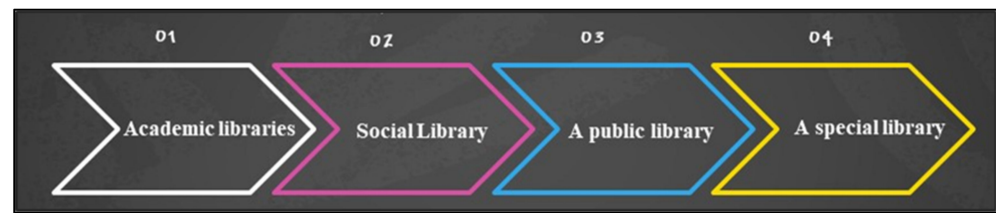
The research process was based on the descriptive-analytical approach, and the relevant literature was presented, and the description of the interior design of the academic library at the College of Education, King Faisal University, in which the study was conducted, was presented, and real information was collected about the library and its interior design problems, and used in the application of the correct design, followed by the proposal for the design by the researcher for the academic library, which he hopes will contribute to providing a suitable research environment for students and faculty members by the standards of the interior design of the academic library to achieve efficient internal use and create a friendly place for library users.

### 8.1. Study Tool

- The researcher used an opinion poll tool consisting of 22 questions directed to the beneficiaries of the faculty members and students about the current interior design of the academic library to reveal the opinions and needs of the users. The response of the beneficiaries on the card is (yes or no) to a sample (consisting of 67 users of faculty members and students).
- Then, this tool (an opinion poll) was distributed again to the beneficiaries to know their opinions about the design proposal for the academic library submitted by the researcher so that the beneficiaries' response to the card would be (yes or no) and the sample consisted of 67 users of faculty members and students.

## 8.2. Types of Libraries

There are four major categories of libraries as Figure 1:



**Figure 1.** The diagram shows the types of libraries.

- **Academic libraries:**

The academic library is part of the politics, part of the culture, and part of the response of its parent institution; whatever affects higher education, affects academic libraries [6]. Academic libraries are the libraries that are located in universities, colleges, and institutes and are characterized by their important role in supporting their affiliated institution to meet educational needs and support studies at the undergraduate and graduate levels by supporting curricula, scientific research, and research by faculty members and students at the university [11].

Components of the academic library space:

- Lecture halls.
- Collaborative learning and meetings.
- User seating units.
- Workstation spaces.
- Viewing and listening rooms [12].

Modern Academic Libraries:

In the twenty-first century, academic libraries are in a technological transformation from what they were before, where information, scientific resources, and books are accessed digitally via the internet, containing books, references, e-books, seating units for collaborative or individual learning, and meetings [13].

- **Social Library:**

This type of library has an essential role in society, as libraries are a source of knowledge and culture in addition to the services provided by the library, as it opens the way for learning and helps in eradicating illiteracy and education in addition to helping to form ideas through reading and perusal, which enhances the progress of society culturally, scientifically, and creatively.

- **Public Library:**

This is a library that is available for all people and is considered a local gateway to knowledge that contributes to the cultural development of the person and social groups [14].

- **Special Library:**

A special library is a library that specializes in providing information sources on a specific topic, meaning that it serves a targeted group of users and helps specialists in providing the services they need. Examples of private libraries (are corporate libraries, government libraries, medical libraries and others) [15].

Types of Academic Libraries as Figure 2 [16].



**Figure 2.** The diagram shows the types of academic libraries.

Main places of the Academic Library:

- The main reading room:

This is a vital and very important area in terms of movement and activity, and its area is determined by the number of visitors, and the following conditions are required: that it be in the heart of the library, that it be close to the area of the book galleries and have a direct relationship with it, provided with good lighting suitable for reading.

- The circulation section:

The circulation section is a section attached to the main reading section that contains books, references, letters, and other educational materials organized in a way that allows and helps to control the process of borrowing and retrieval in an orderly and accurate manner.

- Department of Scientific Journals:

This section is considered one of the important and main sections in the libraries, on which the library depends mainly to respond in meet the continuous needs in providing information and modern research resources in the field of specialization for researchers and scholars.

- Retreats:

These are separate rooms equipped with cupboards and shelves for books and references. They also contain cupboards belonging to the researchers to keep their papers. The spacers between these rooms should be made of sound-insulated glass (transparent dividers) to provide natural light with an artificial light source as well as furniture items suitable for each room. These rooms are supported by auxiliary rooms such as photocopying, printing, and computers.

- Library Management:

The library management is considered the main body responsible for the library by performing the various functions according to the internal departments, and its interior design must be commensurate with the work volume and the number of employees [17].

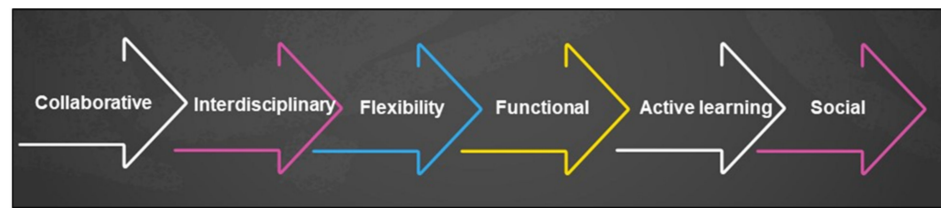
## 9. Discussion

- The results related to the first question:
- What are the necessary design standards for designing academic libraries in universities?

To answer this question, the researcher presented the design and planning considerations for academic libraries that should be taken into consideration when designing, planning, and developing academic libraries.

Planning considerations of the academic library:

There are scientific terms related to the description, planning, and design of the academic library, such as Figure 3.



**Figure 3.** The diagram shows scientific terms for planning and design of the academic library.

- The layout and interior design of the library should be commensurate with its nature, functional sections, the number of visitors, and their needs.
- The academic library should be designed on a functional basis.
- The need to focus on the effective interior design of the spaces designated for students and faculty users to support learning and provide for their needs.
- The main study and reading areas should be close to the bookshelves.
- The interior design of the academic library must be able to expand and develop in the future [18].
- The physical space plays an important role in helping the academic library meet the needs of users. The movement paths that link the departments and some of them must be taken into account to help in accommodating a large number of students and faculty members through the library space daily.
- The designer should facilitate entry and exit and eliminate congestion and conflict in the movement paths between visitors and employees by allocating a special entrance to the administration.
- All the major factors that affect the use of academic library space must be taken into account.
- Providing technological services that the academic library should provide to its students and users, ideal places to provide computers and other information technology.
- Achieving calm in the library through the use of tightly closed windows, which provide sufficient calm.

The attributes of the Modern Academic Library:

- Full of natural light.
- Shelves are easy to reach.
- Technology is accessible to patrons and visible to staff.
- Possibility to sit for cooperation and independent work.
- Seating for collaboration and independent work.
- Distinct zones for different uses [19].

Academic Library Lighting Standards:

Natural lighting:

This is the lighting that comes from the sun, and its amount in the interior space depends on the number and area of wall openings such as windows and skylights. It is physiologically most appropriate for humans, but it changes and varies with time and season. The natural lighting provides visual and psychological comfort for humans and helps with activity and vitality. Natural lighting is the best in academic libraries, as it is an essential component of architecture and light is one of the most important elements of interior design. Relying on modern technologies, engineers have tried to control the harmful part of the sun's rays and use its heat. Natural daylight helps reduce energy consumption and can be a source of glare, so adjustable window coverings should be provided to allow direct sunlight into the reading areas.

Artificial Lighting:

This is the illumination received from electric lamps, and it is based on three main ways to illuminate the space:

- General lighting: This is the lighting homogeneously used throughout the library.



- Thematic lighting: This is lighting certain areas of the internal space of the library to help illuminate certain sections and functions.
- Focused lighting: This is a type of objective lighting that focuses on specific functions in the library [20].

The internal environment of libraries contains various elements, the most important of which is lighting, because most of the activities that take place in libraries are directly related to sight. The quality of the internal environment of the library depends on the quality of lighting and space adequacy in addition to its layout and the quality and diversity of furniture.

In addition, the process of providing appropriate lighting for reading and work halls depends on the proper use of natural and artificial lighting, simultaneous use, or each one alone, according to what the need requires. Reading and searching are very important in libraries. It requires the provision of good lighting which is appropriate aesthetically and functionally for the success of the library's interior design in general. The tasks within the library depend mainly on high-quality lighting, as technology has introduced new and advanced types of lighting requirements, as it affects the interior design of the library significantly and can also improve its efficiency.

- Bookcases should be provided with adequate lighting so that users can access references and books simply and without visual disturbance.
- The general lighting design of the library should be suitable for many activities.
- Artificial lighting is used in case of insufficient natural lighting using fluorescent lamps, and the lighting from electric lamps must be indirect so as not to cause luster.
- Plastic paper curtains were used for the windows to block direct sunlight.

Challenges with Academic Libraries:

- Noise:

Noise in libraries, in general, is a constant concern for library users, students, faculty, and administrators. It is one of the common problems, and by using some solutions such as installing sound insulation techniques, noise can be controlled and modified. [21]

- Power and capacity outlets:

This is possessing sufficient "strength". Having sufficient power is required for beneficiaries to charge their devices. Spaces without sufficient power for the users result in them being underused by the students.

- Sharing space with learning partners:

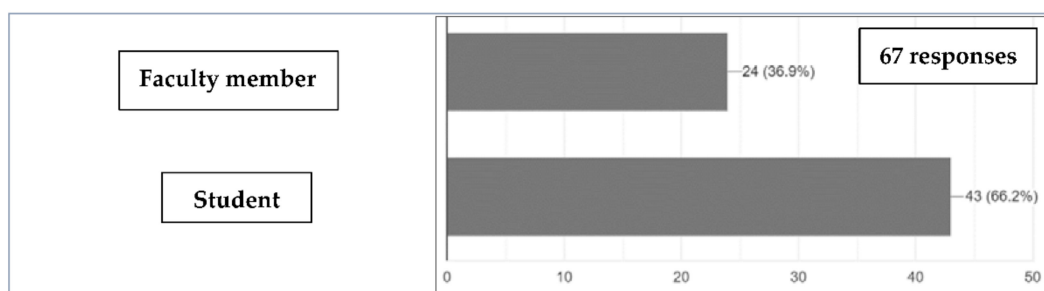
Allocate space for learning partners on campus. Some of these partners required more space than initially anticipated.

- Technology and its impact:

Patrons come to the library to use a variety of modern technologies. Technology provides a tool for academic library services. It also works on shaping and defining how services are provided to beneficiaries.

- The results related to the second question:
- What is the reality of the academic library at the College of Education at King Faisal University in the shade of the design standards that need to be developed?

To answer this question, the researcher used an opinion poll tool by designing a card consisting of 22 questions directed to the beneficiaries of the faculty and students about the current interior design of the academic library to reveal their opinions and needs through their responses to an opinion poll, and 67 responded shown in Figure 4, and as shown in Table A1; two were excluded because they were not valid.



**Figure 4.** The distribution of the sample between the responses of faculty members and students.

#### Opinion poll result:

From the previous figure, we find that the sample consists of 67 beneficiaries, of whom 24 are faculty members (36.9%) and 43 are students (66.2%). Two were excluded because they were not valid.

From Table A1, it is clear that 87.7% of the beneficiaries' responses emphasized the role of the interior design of academic libraries in providing an attractive and effective learning environment for the beneficiaries, and 83.1% emphasized the importance of developing the current interior design of the academic library by developing furniture items for the different needs of cooperative and individual education, and reaching a design atmosphere that achieves visual comfort, as the current interior space of the academic library does not fit the design and functionality with the needs of the beneficiaries. A total of 80% of responses confirmed that the interior design of the library does not fit the requirements of the times and 73.8% responded that the floor plan of the library was not properly planned. In addition, 76.9% confirm that the current interior design does not achieve visual coherence and a sense of familiarity.

In addition, the distribution of book and reference storage units is not proportional to the library space, as it is concentrated in some aspects, causing narrow movement paths in some parts and widening in other parts. A total of 86.2% of beneficiaries expressed their opinion in changing the colors used. They also confirmed the lack of equipment for electronic search sources by 83.1%, and 81.5% would like to remove the vertical wooden dividers used to divide the internal spaces of the library, which affects the narrowness of space and the feeling of lack of visual communication between the beneficiaries. Some of the views of the beneficiaries were that the current internal environment of the academic library provides for the different needs of cooperative or individual education by 40%.

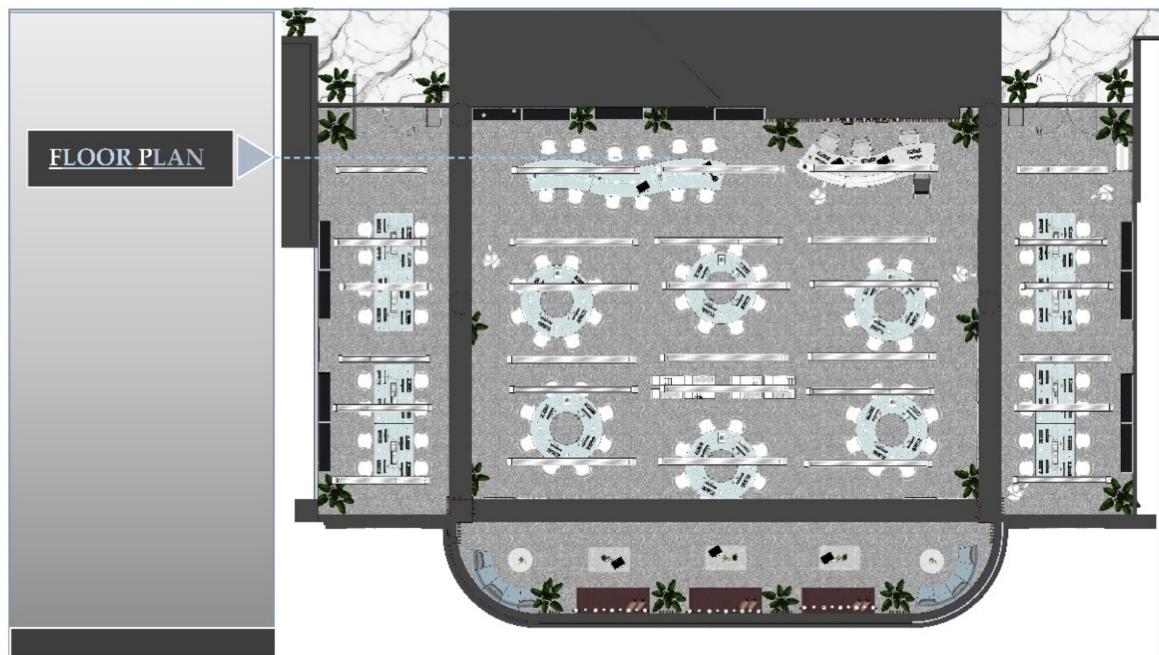
The proposed design of the Academic Library of the College of Education—King Faisal University.

#### Academic library shape

When determining the basic shape of the academic library at the College of Education, we find that its shape is square, whereas library engineers and consultants agree that the most functional form of the library is the square or a series of squares. Architects sometimes see the square shape as too simple and uninteresting; however, long, narrow spaces and round rooms do not allow for effective planning of shelving ranges or good visual control by staff. The square shape is also easy to divide and rearrange regardless of whether the library is large or small. Successful academic library design relies on large, flexible spaces that can be easily rearranged as the needs of the library change from time to time; shelving and book storage must be planned to accommodate them [22].

#### Library Zoning:

The primary goal of effective library design and space planning is that the facility must respond to the needs of students and faculty members. The floor plan of the library shows its interior design through the distribution of the different functional sections and their relationship to each other with a study of the internal movement paths between the functional sections as Figure 5.



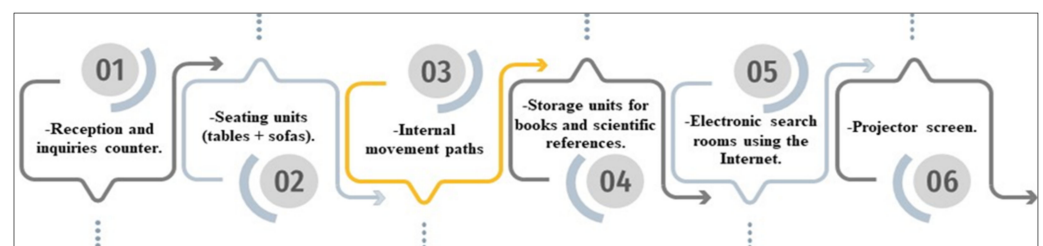
**Figure 5.** Floor plan of the academic library.

The proposed floor plan of the academic library:

The layout of the floor plan of the library space comes in all shapes and sizes, and the primary goal of effective library interior design and space planning is that an academic library should provide design and functional requirements of users and respond to the needs of its students and faculty while defining the interior departments, their spaces, and their needs [23].

Library equipment

This term includes roughly the items and vocabulary of library furniture from seating units, tables, storage units, and shelves for books and references, supplies, and tools with which the library operates as Figure 6 [24].



**Figure 6.** The diagram shows the components of the academic library.

It consists of:

1. Reception and inquiries counter.
2. Seating units (tables + sofas).
3. Internal movement paths.
4. Storage units for books and scientific references.
5. Electronic search rooms using the internet.
6. Projector screen.

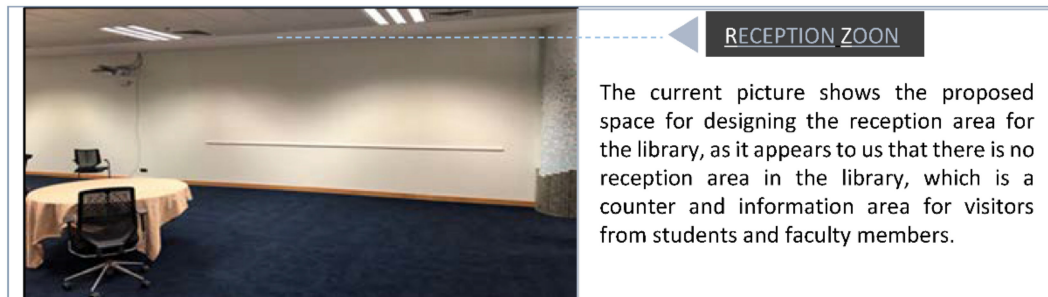
Internal Perspective of the Library as Figure 7.



**Figure 7.** The perspective of the academic library.

#### Design of Reception Desk:

The proposed interior design of the academic library of the College of Education at King Faisal University as Figure 8. provides quiet and conducive areas for study as well as common areas for university study and collaboration and provides reading areas, discussion areas, learning, and research areas, and facilities for accessing electronic resources. The proposed finishes were carefully shaped, and there was a conscious decision to continue coordinating the interior design elements, the various furniture elements, the materials used, and the colors suggested in the design. Bookcases are designed as a different combination of shelves that allows users to store and display books in a smooth and easily accessible way as well as computer desks, tables, and chairs to get the right balance in distributing different furniture items according to functional requirements and according to capacity for different activities. It also designed integrated spaces for student discussions and presentations, providing spaces designed for small group meetings as Figure 9.



**Figure 8.** The proposed space for the design of the reception space in the library.



**Figure 9.** The perspective of reception and inquiries counter.



The reception must be directly connected to the entrance with its connection to the library's internal monitoring network as Figure 10; it is wide enough and the largest number of students passing at any time is counted. The reception counter as Figure 11. is designed to inquire about data, books, or references needed by researchers, as well as for external or internal borrowing. It is designed to suit everyone in addition to people with special needs. The back of the information counter is designed with a cladding of wooden slats, 3.5 m high and 6 m wide to cover the back of the counter.



Figure 10. Internal perspective shows reception and seating units.

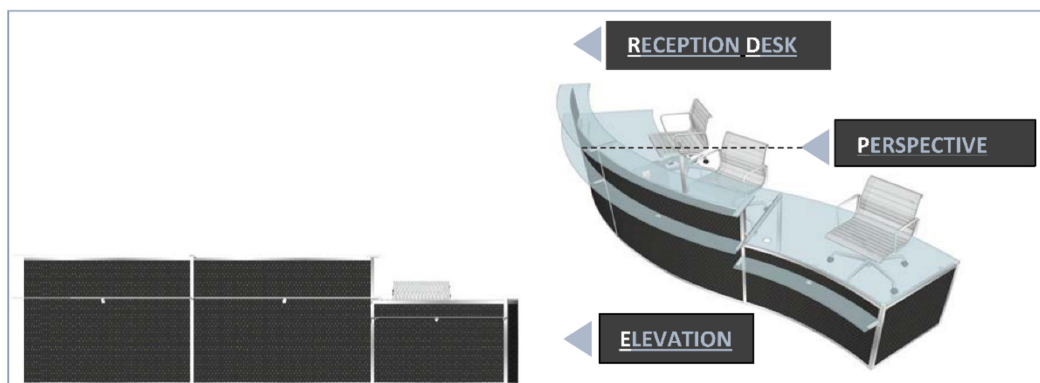


Figure 11. Reception desk design.

The proposed new colors in the design.

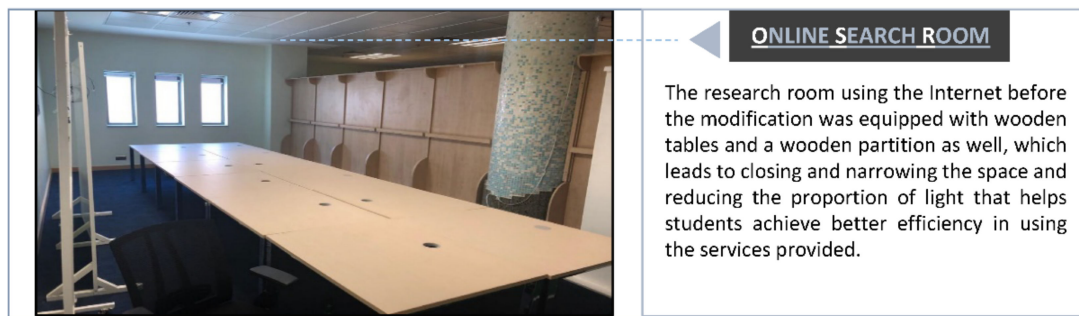
The colors of the academic library trended to neutral tones to create a mobile library to view, research, and learn, in addition to the possibility of clarity of architectural details.

The appropriate light gray color for the walls was chosen, with the use of neutral colors in the interior space, and white color in the chairs, and burgundy color in the seating units (sofas); it is also preferable to use warm colors in the reading space. The columns are clad with straight brown wooden ribs with a dark gray color for the carpet of the library flooring instead of the dark blue color. Transparent glass partitions were used to divide the interior spaces according to the design instead of opaque wooden partitions, which caused the narrowness of the interior space and the inefficiency of lighting, the failure to achieve visual communication and a feeling of spaciousness, and the expansion of the library space.

Digital Resource Department:

Digital Resource Department: This section is mainly responsible for offering computer-based library services. It has 32 computers for the library students and faculty members. The use of computers throughout the academic library needs to be planned in the library's structure and systems simultaneously with the interior design to ensure continued energy savings at computer locations as Figures 12 and 13.





**Figure 12.** Internal perspective of an online search room before modification.



**Figure 13.** Internal perspective of an online search room suitable for 16 researchers.

The space was re-designed as Figure 14. by changing the furniture to modern furniture (glass tables equipped with computers and internet networks) with the replacement of the wooden partition with a glass partition that helps privacy in addition to achieving the internal visual connection to the library while allowing interior lighting and linking the functional spaces to each other and adding some storage units for books or tools for users. A glass partition that was installed in place of the wooden partition, with dimensions of 5.65 cm in width and 2.65 cm in height, was placed to separate the space for searching online and borrowing books and reading them. It achieves transparency and privacy for researchers. The glass partitions are considered a demountable wall so the spaces can be reconfigured over time. The concept of transparency is an approach to showcasing learning activities taking place in the academic library through open concepts, technology, and furnishings, and limiting physical barriers that might otherwise obstruct a user's open view.



**Figure 14.** The internal perspective of an online search room consists of two glass tables.

Standards for selecting Academic Library Furniture

Academic libraries have very particular requirements that all their furnishings must meet. The selection and arrangement of furniture within the library is an important issue

that needs to consider the human factors that influence how people interact within the environment. It is also relevant in the interior design of the library which demonstrates the concept of acceptable personal space to feel comfortable, through how close people are to sitting or standing next to each other. There are a few important factors to consider whenever you are designing furniture items for an academic library. Reading desks and tables are the important components of library furniture. Library furniture consists of many types of racks to display all kinds of books that students could pick and read themselves. It is necessary to know the appropriate standards for choosing furniture in the academic library. The furniture must be stable and durable, characterized by efficiency, comfort, and resistance, and made of good materials; furniture and design play a huge role in determining how students interact with a library through the following:

1. The design concept is based on balancing the needs of the users, students, and faculty members, and the ability to make the most of the designed space.
2. The interior design of academic libraries should provide an appropriate study for all internal functional departments in an innovative conception that helps in the effective use of the library.
3. Appropriate furniture in the library can make a huge difference to the attractiveness and functionality of library spaces.
4. The durability and reusability of furniture items.
5. The furniture item contributes to creating a balanced environment.
6. The need for natural light and artificial light to ensure that the area is properly lit, thereby avoiding eye strain [25].

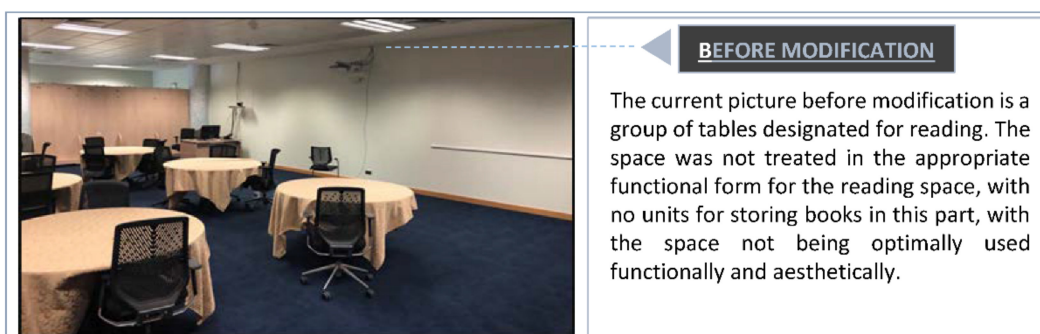
Flooring:

High-efficiency materials have been used for permanent use, and floors can be covered with insulating materials such as carpets and rugs to reduce noise by absorbing sound in reading spaces.

Search and Reading Hall:

Reading hall standards:

- It should be in the heart of the library as Figure 15.
- It should be in the quietest area of the library.
- It is preferable to take into account the entry of natural light.
- Preferably near the entrance.
- The paths of movement must not conflict.



**Figure 15.** The interior design of the reading space before modification.

The reading and borrowing space have been modified by removing the wooden divider and adding storage units for books with a modern design that matches the interior design and used furniture pieces as Figure 16. In addition to providing the reading part with rectangular glass tables, the distribution of internal lighting was taken into account, which achieves comfort for users as Figures 17 and 18.



**Figure 16.** The interior design of the reading space contains modern glass tables and storage units for books and internal borrowing.



**Figure 17.** The interior design of the reading hall space contains tables and computers for online search and storage units for books and internal borrowing.



**Figure 18.** Shows the space for reading and research.

#### Library Bookcases:

Library bookcases are a great addition to any working environment, providing storage and display space while helping to keep your workspaces clean, tidy, and organized.

There are some considerations in distributing them within the library:

- The dimensions of the aisles between the shelves should be considered, which should reach 85 cm in libraries that many users come to. The shelves were distributed in the center of the hall to avoid the sun's rays and surrounded the reading areas where the shelves are divided according to the topics.
- It should be taken into account that the maximum height of the bookshelves is 175 cm.
- The bookcase units in this form were distributed in the parts of the library, where they were placed in the middle of the library hall according to the design standards of libraries. They were also attached to the glass partitions and shelves were placed in



front and behind the glass partition to become double shelves and were distributed numerically in proportion to the internal dimensions of the library as Figures 19 and 20, providing book storage and scientific resources according to the different disciplines and internal departments of the library.



**Figure 19.** The interior design shows the glass partition, book storage units, and interior paths.

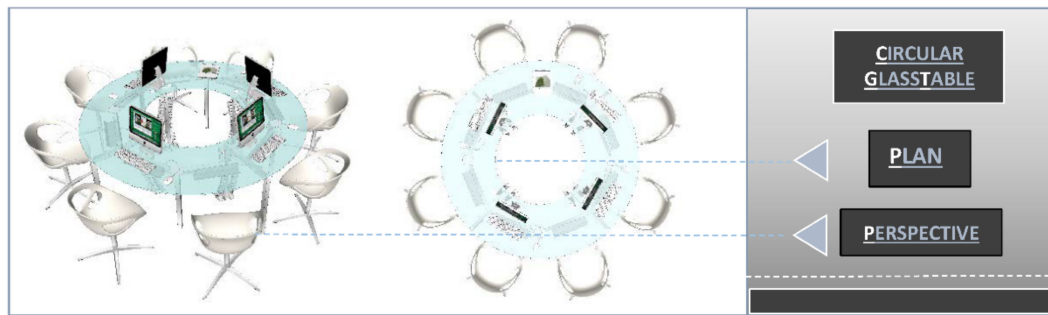


**Figure 20.** Storage units for books.

Providing appropriate furniture in the interior space of an academic library makes a difference in the attractiveness and function of academic library spaces. This in turn increases the attraction for students to use the spaces more fully; a variety of seating units that help support teamwork is therefore essential in designing an effective collaborative seating space. Various seating and work surfaces must be adapted to meet the needs of different group activities and be appropriate to the size of the group with technical support as Figures 21 and 22 [26].



**Figure 21.** The current picture shows the space for reading and borrowing.

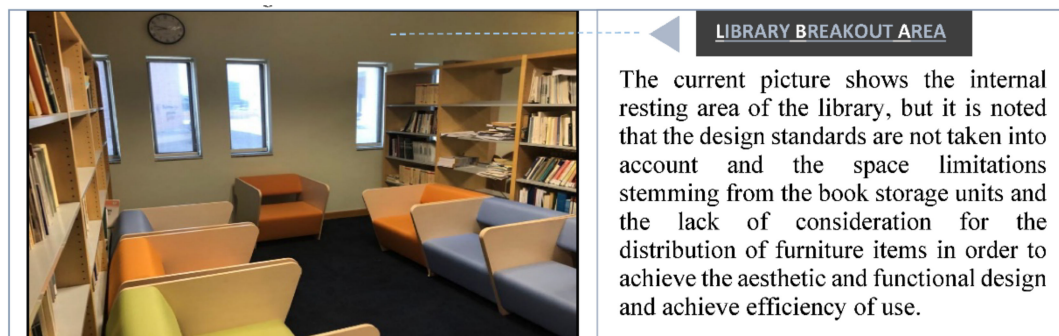


**Figure 22.** The library contains 6 modern glass circular tables, each table accommodates 8 people, and the total number of round tables accommodates 48 people.

#### Library Break Areas:

Seating space is an essential element in the design of the academic library. The library should have a variety of seating units such as benches, reading benches, and reading tables to choose from around the approach to learning. The reading area in the design model proposed for the academic library is also carefully designed so that the visitor can choose an individual reading area or a common area [27].

Figure 23 shows the proposed design of break areas, where the seating units were designed as contemporary furniture to allow users to sit and read or study in a quiet atmosphere that enjoys privacy, in addition to providing a shared social space, and allowing students to spend time away from desks. The book storage units were re-placed in a better design. The walls were also designed with some wooden cladding. In addition to providing natural light through windows, effective use of daylight can reduce energy consumption as Figure 24. The library is not only the nerve center of academic learning but also a good place to spend one's leisure time. Plastic paper blinds were used for the openings to block direct sunlight.



**Figure 23.** Shows the internal resting area of the library.



**Figure 24.** The picture shows the proposed design of break areas.



Movement paths within the library:

Internal movement paths in academic library design relate to three paths of movement.

1—Reader movement:

Which is considered one of the most important movements within the library and must be connected to all services without any complexity.

2—Staff movement:

Since the administration is one of the most important spaces within the library, and also because the employee provides the services required for readers.

3—The movement of books, references, and various services of the library:

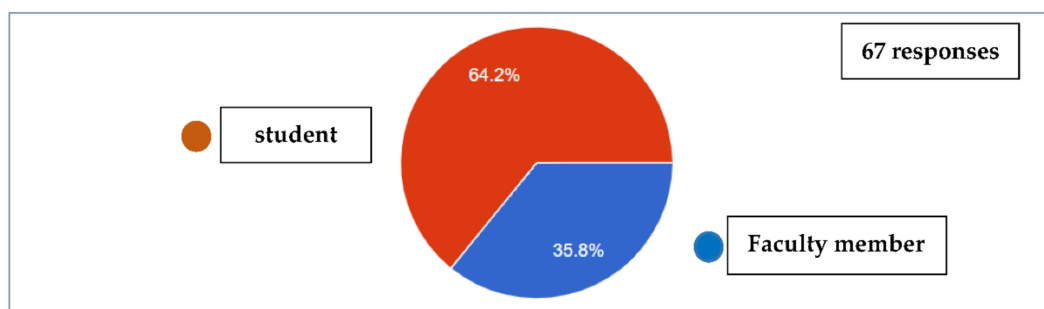
It must be a hidden movement, that is, none of the visitors feel it, and it usually has a back entrance [28].

- The results related to the third question:
- What is the proposed vision for designing a better interior environment in the academic library at the College of Education at King Faisal University in light of the necessary design standards?

To answer this question, the researcher distributed this tool (opinion poll) consisting of 22 questions again to the beneficiaries to reveal their opinions about the design proposal of the academic library of the researcher, and 65 responded, as shown in Table A2.

Opinion poll result:

From the previous figure, we find that the sample consists of 67 beneficiaries, of whom 24 are faculty members (35.8%) and 43 are students (64.2%) as Figure 25.



**Figure 25.** The distribution of the sample between the responses of faculty members and students.

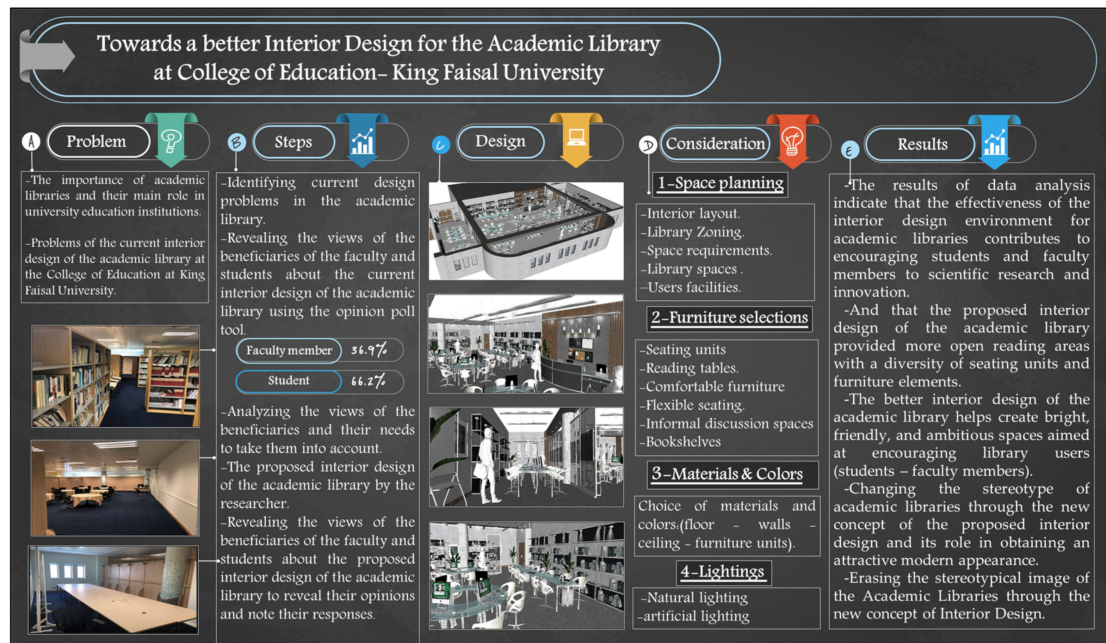
The proposed design of the academic library was discussed by presenting it to the beneficiaries of the faculty and students, which was well received and satisfied through their opinions on the opinion poll. This is evident in Table A2. By analyzing the opinion poll of the beneficiaries' responses about the proposed design of the academic library from the researcher, where 67 beneficiaries responded, we find that there is general satisfaction with the new proposed design of the library, and many questions were approved by 100%, which was in response to the views and aspirations of the beneficiaries from faculty members and students on the development of the interior design of the academic library in line with the requirements of the times and their needs, and the modification of the floor plan design and functionality to achieve the efficiency of internal use, which has a positive impact on the beneficiaries.

In addition to providing the library with various and appropriate items of furnishing and interior fixtures, the efficient use of natural and artificial lighting be considered was taken into account. Some opinions, which constitute a small percentage of 9%, were about the inappropriateness of the color scheme in helping to feel energetic and the desire to learn.

Project Description:

The developmental design proposal of the academic library of the College of Education in the student departments at King Faisal University is an important objective that aims to develop the interior design of the library through a modern and innovative design vision commensurate with the nature of the interior space and its requirements, in addition to

the internal space of the library and how to design it with the most appropriate design solutions, including the realization of services and departments. It should be available in the library to achieve the aesthetic and functional aspect. This is reflected in the actual performance of students and faculty members in general and all library visitors from faculty to university members as Figure 26.



**Figure 26.** The framework explains the steps of the research.

## 10. Conclusions

- The results of data analysis in Table A2 indicate that the effectiveness of the interior design environment for academic libraries contributes to encouraging students and faculty members towards scientific research and innovation.
- Additionally, they indicate that the proposed interior design of the academic library provided more open reading areas with a diversity of seating units and furniture elements.
- The better interior design of the academic library helps create bright, friendly, and ambitious spaces aimed at encouraging library users (students and faculty members).
- The design helps in changing the stereotype of academic libraries through the new concept of the proposed interior design and its role in obtaining an attractive modern appearance.
- The design helps to show the important role of interior designers to create attractive and appropriate academic libraries.
- We erased the stereotypical image of academic libraries through the new concept of interior design.

## 11. Recommendations

- Libraries are good homes for introducing and providing new and experimental technology to students by designing the interior functional spaces that require providing the technology that students need.
- The interior design must be designed to accommodate the academic needs of users.
- The need to pay attention to the design of internal interaction spaces where library users interact with the resources and services provided.
- The necessity of applying modern technology in the interior design of academic libraries to reach more effective and efficient use spaces.

- The need to continuously poll stakeholders about the problems and challenges facing them in the ability to continuously improve, by interviewing the users and conducting questionnaires.

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## Appendix A

**Objective:** Information gathering about the current interior design of the Academic Library.

**Description:** The results of the responses of the sample of the faculty members and students in an opinion poll tool consisting of 22 questions about the current interior design of the academic library, College of Education, King Faisal University to reveal their opinions and needs.

**Table A1.** Opinion poll on the current interior design of the Academic Library, College of Education, King Faisal University from the point of view of the beneficiaries.

No.	Questions	Yes	No
1.	-Does the interior design of academic libraries have a major role in providing an attractive and effective learning environment for the beneficiaries?	57	8
2.	-Is the interior design of the library commensurate with the requirements of the times?	13	52
3.	-Was the layout of the academic library properly planned?	17	48
4.	-Does the interior design of the academic library help you to encourage you to spend better and more time in it?	22	43
5.	-Is the interior space of the academic library in its current form compatible in design and functionality with the needs of the beneficiaries?	15	50
6.	-Have the internal movement paths been taken into account in the floor plan of the academic library?	22	44
7.	-Does the current internal working environment of the academic library provide for the different needs of cooperative or individual education?	26	39
8.	-Are the appropriate interior furnishing items available in the academic library?	14	52
9.	-Does the current interior design achieve visual communication between the beneficiaries and a sense of familiarity?	15	50
10.	-Are the items of office furniture currently available in the academic library commensurate with its area?	8	57
11.	-Are the office furniture elements characterized by the aesthetic and functional aspects?	8	57
12.	-Is the furniture used flexible and easy to move and rearrange?	15	50
13.	-Were a variety of seating units used to suit the functional needs of the beneficiaries?	10	55
14.	-Did the lighting sources vary between functional and aesthetic lighting?	7	58

**Table A1.** *Cont.*

No.	Questions	Yes	No
15	-Were the natural light sources in the internal library space used efficiently?	9	56
16	-Are the wooden vertical dividers appropriate for dividing the internal spaces of the library?	12	52
17.	-Is the distribution of book and reference storage units proportional to the library space?	13	52
18	-Are the units for storing and keeping books and references appropriate from the design aspect and dimensions with the rest of the design elements?	13	52
19.	-Is there a reception desk that provides services and inquiries for students and faculty members?	26	41
20.	-Do you prefer developing the current interior design of the academic library?	54	11
21.	-Do the colors used help to feel active and desire to learn?	10	55
22.	-Does the current interior design have electronic research sources?	11	54

## Appendix B

Objective: Information gathering about the proposed interior design for the academic library.

Description: The results of the responses of the sample of the faculty members and students in an opinion poll tool consisting of 22 questions about the proposed interior design for the academic library, College of Education, King Faisal University to reveal their opinions and needs.

**Table A2.** Opinion poll on the proposed interior design for the academic library, College of Education, King Faisal University from the point of view of the beneficiaries.

No.	Questions	Yes	No
1.	-Does the interior design of academic libraries have a major role in providing an attractive and effective learning environment for the beneficiaries?	67	0
2.	-Is the proposed interior design of the academic library commensurate with the requirements of the times?	67	0
3.	-Was the layout of the academic library properly planned?	66	1
4.	-Does the proposed interior design for the academic library help you encourage you to spend better and more time there?	66	1
5.	-Does the interior space of the academic library fit in design and functionality with the needs of the beneficiaries?	66	1
6.	-Have the internal movement paths been taken into account in the floor plan of the academic library?	66	1
7.	-Does the internal working environment of the academic library design proposal provide the different needs of cooperative or individual education?	66	1
8.	-Do the proposed design have the appropriate interior furnishing elements in the academic library?	63	4
9.	-Does the proposed interior design achieve visual communication between the beneficiaries and a sense of familiarity?	67	0
10.	-Are the office furniture elements in the design proposal for the academic library commensurate with its area?	64	3
11.	-Are the office furniture elements characterized by the aesthetic and functional aspects?	67	0
12.	-Is the furniture used flexible and easy to move and rearrange?	64	3
13.	-Were a variety of seating units used to suit the functional needs of the beneficiaries?	61	6
14.	-Did the lighting sources vary between functional and aesthetic lighting?	66	1

Table A2. Cont.

No.	Questions	Yes	No
15	-Were the library's internal natural lighting sources used efficiently?	65	2
16	-Are the vertical glass partitions suitable for dividing the internal spaces of the library?	67	0
17.	-Is the distribution of book and reference storage units proportional to the library space?	66	1
18	-Are the units for storing and keeping books and references appropriate from the design aspect and dimensions with the rest of the design elements?	65	2
19.	-Is the reception desk appropriate by design to provide services and inquiries to students and faculty members?	67	0
20.	-Is the proposed interior design for the academic library commensurate with your future aspirations?	65	2
21.	-Do the colors used in the proposed design help to feel active and desire to learn?	61	6
22.	-Does the proposed interior design of the academic library have electronic research sources?	67	0

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