



Lisbon School
of Economics
& Management
Universidade de Lisboa

MASTERS IN MANAGEMENT (MIM)

MASTERS FINAL WORK

PROJECT

***STUDY SPACES AT ISEG: ENHANCING INDIVIDUAL STUDY
IN THE LIBRARY***

JOÃO PEDRO CARLOS MESQUITA

SUPERVISOR:

PROFESSOR MARIA EDUARDA SOARES

PROFESSOR VICTOR BARROS

MARCH - 2023

ACKNOWLEDGMENTS

Firstly, I would like to thank my supervisors in the journey to develop this project, Professor Maria Eduarda Soares and Professor Victor Barros. I would like to express my gratitude for all the availability they had during the development of this project, for all the help and advice they gave me throughout this journey.

I would also like to thank ISEG, which has been my university for the last 5 years, where I completed my Bachelor's degree and my Master's degree. This period of my life now comes to an end with the conclusion of this project. It was 5 years where I felt myself growing as a person and as a professional and where I gained the tools to be successful at the start of a professional life.

To my friends who were present during this journey, for all the moments we spent together and for always motivating me in the most difficult moments. To my Master's degree colleagues for all the mutual help and solidarity during the development of this project, with a special thanks to Beatriz Oliveira who accompanied me during the various stages of this challenge.

Last but not least, I would like to thank my family, who have always supported and motivated me, and were always available to help me in any circumstance of my academic journey. A big thank you for giving me the opportunity to do this Master's degree and to follow my goals.

ABSTRACT

The aim of this project is to understand the challenges that academic libraries are going through in this new digital era, where their main purpose is changing, from a place to store books to a more human centered space for people to gather, work and study. Particularly, it aims to understand how the current ISEG library can evolve and become a more relevant space for ISEG students for the times to come.

Through a literature review, this project aims to understand how libraries around the world have been adapting, what philosophy they have been following to redesign their spaces to become more relevant and useful for their communities, and what conclusions have already been found for the renovation of libraries and study spaces to the current reality.

A quantitative questionnaire was also used to gather more information for the project, allowing a deeper understanding of the current situation of ISEG's study spaces and its library. Through an online questionnaire, with 76 participants, it was possible to collect information on the study habits of ISEG students, understand their current needs in relation to the existing study spaces, and identify what are the needs for new services and resources.

The analysis of these results confirmed that the library study spaces need to be updated, the library spaces at ISEG are used mainly to study and work, and not to access books or information, which reinforces the need to renovate these spaces, converting them into spaces more dedicated to study and work. At the end, potential solutions for the current ISEG spaces are presented, suggesting the best ways to adapt the ISEG library, based on all the information collected in literature and as well as based on the student's opinions gather from the project questionnaire.

Keywords: Library, Study Spaces, Individual Study, Individual Work, Individual Reading

RESUMO

O objetivo deste projeto é compreender os desafios que as bibliotecas académicas estão a enfrentar nesta nova era digital, onde o seu principal objetivo está a mudar, de um lugar feito para armazenar livros para um espaço mais centrado nas pessoas, onde estas se podem reunir, trabalhar e estudar. Este projeto pretende também compreender como a atual biblioteca do ISEG pode evoluir e tornar-se num espaço mais atrativo e relevante para os estudantes do ISEG para os tempos futuros.

Através da revisão bibliográfica, este projeto pretende compreender como as bibliotecas ao redor do mundo têm vindo a adaptar-se, que filosofia têm seguido para redesenhar os seus espaços de modo a tornarem-se mais relevantes e úteis para as suas comunidades e que conclusões já foram encontradas sobre a renovação das bibliotecas e dos seus espaços de estudo para a atualidade.

Foi também utilizado um questionário quantitativo para recolher mais informações para este projeto, permitindo uma compreensão mais profunda da situação atual dos espaços de estudo do ISEG e da sua biblioteca. Através de um questionário online, que contou com 76 participantes, foi possível recolher informações sobre os hábitos de estudo dos alunos do ISEG, compreender as suas necessidades atuais em relação aos espaços de estudo existentes e identificar quais são as necessidades de novos serviços e recursos.

A análise destes resultados confirmou que os espaços de estudo da biblioteca precisam de ser atualizados, que são utilizados principalmente para estudar e trabalhar, e não para a consulta de livros ou informação, o que reforça a necessidade de renovar estes espaços, convertendo-os em espaços mais dedicados ao estudo e ao trabalho. No final, são apresentadas possíveis soluções para os atuais espaços do ISEG, sugerindo as melhores formas de adaptar a biblioteca do ISEG, com base em toda a informação recolhida na literatura e também com base nas opiniões dos estudantes recolhidas a partir do questionário do projeto.

Palavras-Chave: Biblioteca, Espaços de Estudo, Estudo Individual, Trabalho Individual, Leitura Individual

ABBREVIATIONS

ISEG: Instituto Superior de Economia e Gestão

SDG: Sustainable Development Goal

UN: United Nations

AACSB: Association for Advance Collegiate Schools of Business

MBA: Master in Business Administration

AMBA: Association of MBAs

ÍNDICE

| | |
|------------------------------------------------------------------------------------|------------|
| ACKNOWLEDGMENTS | I |
| ABSTRACT | II |
| RESUMO | III |
| CHAPTER 1. INTRODUCTION | 1 |
| 1.1 Context. | 1 |
| 1.2 Relation to Sustainable Development Goals (SDG's)..... | 2 |
| CHAPTER 2. LITERATURE REVIEW | 3 |
| 2.1 Making the library attractive | 3 |
| 2.2 Effect of colors on a space..... | 4 |
| 2.3 Flexibility and adaptability..... | 4 |
| 2.4 Learning Space Attributes..... | 5 |
| 2.4.1. Access and linkage | 5 |
| 2.4.2. Use and activities..... | 6 |
| 2.4.3. Sociability..... | 6 |
| 2.4.4. Comfort and image..... | 7 |
| 2.5 Libraries Models..... | 7 |
| 2.6 .The Four-space model..... | 8 |
| 2.6.1. Inspiration space..... | 8 |
| 2.6.2. Learning space..... | 9 |
| 2.6.3. Meeting Space | 9 |
| 2.6.4. Performative Space..... | 9 |
| CHAPTER 3. METODOLOGY | 10 |
| 3.1 Research Context..... | 10 |
| 3.1.1. The Lisbon School of Economics and Management (ISEG)..... | 10 |
| 3.1.2. ISEG's Library | 11 |
| 3.2 Type of Study and Purpose..... | 12 |
| 3.3 Sampling and Data Collection Method..... | 12 |
| 3.4 Questionnaire Development..... | 12 |
| CHAPTER 4. EMPIRICAL ANALYSIS | 14 |
| 4.1 Introduction | 14 |
| 4.2 Sample profile..... | 14 |
| 4.3 Analysis of the use of the current ISEG study spaces dedicated questions | 15 |
| 4.4 Analysis of the reading space dedicated questions | 21 |
| 4.5 Analysis of the individual study space dedicated questions | 21 |
| 4.6 Analysis of the individual workspace dedicated questions | 23 |
| 4.7 Analysis of differences..... | 23 |
| CHAPTER 5. CONCLUSIONS | 26 |
| 5.1 Summary of the questionnaire results | 26 |
| 5.1.1. Creation of a reading space | 28 |
| 5.1.2. Creation of an individual study space..... | 28 |
| 5.1.3. Creation of an individual workspace | 28 |
| 5.2 Proposed solutions for the redesign of the ISEG library | 29 |
| 5.2.1. Proposed solutions for a reading space..... | 30 |
| 5.2.2. Proposed solutions for an individual study space..... | 31 |
| 5.2.3. Proposed solutions for an individual workspace | 32 |
| 5.3 Proposal of new blueprints | 32 |
| 5.4 Limitations and future research..... | 34 |

TABLE INDEX

| | |
|-------------------------------------------------------------------|----|
| Table 1 – Sociodemographic Characterization of the Sample | 15 |
| Table 2 – Importance of dedicated study spaces | 18 |
| Table 3 – New features for the ISEG Library | 20 |
| Table 4 – Reading space features | 21 |
| Table 5 – Individual study space features importance | 22 |
| Table 6 – Individual workspace features usefulness | 23 |
| Table 7 – Differences of mean concerning student program..... | 24 |
| Table 8 – Differences of mean concerning the student gender | 25 |

GRAPHICS INDEX

| | |
|-----------------------------------------------------------------|----|
| Graph 1 – Use and purposes of ISEG study spaces..... | 16 |
| Graph 2 – Use of ISEG campus spaces to study | 17 |
| Graph 3 – Use of ISEG library spaces..... | 17 |
| Graph 4 – State of the ISEG Study Spaces..... | 18 |
| Graph 5 – Importance of study space elements and features | 19 |
| Graph 6 – Green elements in study spaces | 20 |
| Graph 7 – State of the ISEG individual study spaces..... | 22 |

IMAGES INDEX

| | |
|---------------------------------------------------------------------|----|
| Figure 1 – Third floor – Reading space..... | 33 |
| Figure 2 - Second floor - Individual study space and workspace..... | 33 |

CHAPTER 1. INTRODUCTION

This project will focus on the renovation of ISEG's library, more specifically the second and third floor of the library, to adapt the existing spaces to the new needs of students. It aims to explore the various challenges that academic libraries face in the new digital age, including changes in students' expectations about the libraries and study spaces, and the need for new spaces and resources.

Additionally, this project also aims to present potential solutions to these challenges and suggest how ISEG's library can best adapt to deal with these new times and seeks to provide insight into how ISEG's library can become a dynamic hub in the campus and be successful in this new digital age.

1.1 Context

Libraries around the world are currently facing many challenges. With the rise of digital media, they need to find ways to remain relevant and useful for their users in these changing times. Libraries still maintain an important role in this new digital age, but it is important that their design takes into consideration the new needs of users and focus on aspects that cannot be replaced by digital technology. The interaction between users, the sense of scholarships and inspiration, are things that maintain the library space relevant.(Jolly and White, 2016; Li et al., 2018).

The 21st century has seen a dramatic shift in the role of libraries, from traditional repositories of books and other physical materials to dynamic hubs. The easy access to information, books, studies, articles, journals, and magazines online are throwing into question the value of the library as a physical space. For this reason, libraries all around the world are being rethought more as a human centered space and undergoing redesigns from a place to store books to a space for people to gather, work and study (V. Cunningham and Tabur, 2012).

These challenges are also true for the academic libraries, because of the rapidly changing in education methods, that are increasing the use of more digital devices, like the introduction of online classes. Academic libraries need to keep up with this digital transformation, and investing in new technologies, such as e-books, digital databases and adapt their book collection to a more digital environment.

Study spaces at ISEG: Enhancing individual study in the library

Today's students are more diverse and have different activities, which means that libraries need to adapt their services and resources to meet their new needs. This includes creating flexible spaces and developing spaces that are tailored to the specific needs of different activities. Consequently, there has been an increasing need for libraries to create different types of study spaces to accommodate the different activities of their users. This includes creating quiet spaces for individual study, for students who need a distraction-free environment. On the other hand, with the increasing emphasis on collaboration and teamwork in education, many students need spaces where they can work together on projects and assignments. Also, the growing use of technology by students to study and work creates the necessity for new spaces, that can accommodate all those needs (Delcore et al., 2009; Foster and Gibbons, 2007; Twait, 2009).

1.2 Relation to Sustainable Development Goals (SDG's)

ISEG as a university has the objective to embrace the Sustainable Development Goals (SDG) of UN in its fundamental areas of teaching, the campus, education, and community-based activities to become a more sustainable university. The Master's in Management of ISEG also has a focus on the same Sustainable Development Goals.

In line with ISEG objectives toward the SDGs, this project will have in mind the 4th SDG of quality education, which is to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all (UN, 2023). Academic libraries can play a critical role in supporting SDG 4 by providing access to a wide range of academic journals, books, databases, and digital resources to support student research and learning, access to computers and internet, and providing the needed study spaces for the different study styles of its students. From individual work and study spaces for a more focus learning to group spaces that can boost the collaboration between students.

Additionally, this project also embraces the 10th SDG of reduced inequalities (UN, 2023). By providing an equal access to its resources, academic libraries can play a crucial role in reducing inequalities and promoting a more inclusive and equitable environment for the students. Giving all students, regardless of their socio-economic status, resources and spaces for learning.

CHAPTER 2. LITERATURE REVIEW

The following section present a literature review on topics related to the design of libraries and how the design affects their users. This review includes studies on the growing importance of having a diverse variety of spaces in academic libraries to suit all the different needs of the students, from the needs of a student for a space for individual study to the needs of groups and other activities. On the other hand, the review includes studies on the need to create more aesthetically attractive spaces, and flexible spaces that suit better the needs of students and adapt the libraries to the present and future technological environment.

2.1 Making the library attractive

The availability of information online is causing libraries to become less popular as places to look for books and information, and, consequently, libraries all around the world are undergoing changes. Libraries must be redesigned as spaces where people may work, study, and be together, moving from a location built to keep books to a meeting space for people (Gemma, 2016). Even though students are not accessing the print collection, they still prefer to visit the library for their academic pursuits (V. Cunningham and Tabur, 2012).

According to Gemma's (2016) study about the design for libraries in the 21st Century, with an overview of how the redesign of libraries around the world has been used to improve the experience of its users and change their perspective of a library, the library has been reimagined as a place where people can work, study and be together, changing from a place built to store books to a gathering space for people. The main functions of a library for today users are, besides being a space to read, a space to study and a space to meet and gather people.

With today's access to information, people are more attracted to libraries that can offer neutral free space to where they can study, work, and socialize. In other words, a "third place", between the work or classroom and home, where students like to work and study together. For this, it is important that a library offers an informal and comfortable environment where they can meet, study and work. Libraries with lack of space should reduce the number of stacks of books and create more space for people to meet and creating alternatives for the access to books (Gemma, 2016).

2.2 Effect of colors on a space

The good use of color in the workspace can enhance the sense of wellbeing, boost positive mood, and increase productivity. There is strong evidence that color effects human perception and behavior in the workplace. Therefore, it is important to comprehend how the different colors schemes affect people and which color scheme suits better the tasks that are being developed (Savavibool et al., 2018). To maintain the level of quality and efficiency of work, appropriate color selections should be made, and thus it is important to distinguish between the colors that may increase or decrease work productivity (Kamaruzzaman and Ahmad Zawawi, 2010).

Dull or distracting color in the surroundings of the workspace can make people feel bored and distracted. In spaces where people spend a lot of time with boring and distracting colors, they will lose focus and lead to a decline of productivity. On the other hand, in spaces where people spend time using computers, it is important to have comfortable colors, because an inappropriate color scheme will make your eyes hurt. The use of neutral colors, cool blues, and a harmony of warm and cold colors can all increase productivity (Kamaruzzaman and Ahmad Zawawi, 2010).

Mehta and Zhu (2009) conducted a study about the effect of color in cognitive task and the effect on the performance the task, contrasting warm (red) colors and cool (blue) colors and their effect. Results indicate that color influences cognition and behaviors, where the color red represents both the highest level of risk and compliance. In contrast, blue is frequently linked to openness, tranquility, and peace.

Using different color schemes, depending on the nature of the work and tasks, might be beneficial to the productivity. When tasks require detailed and attention and require that people be vigilant or memorizing important information, red and warm colors might be more appropriated. In contrast, when the tasks call for creativity, imagination and brainstorming, blue and cool colors enhance the motivation and will be more beneficial for that space (Ceylan et al., 2008).

2.3 Flexibility and adaptability

Omolola A. et al. (2017) examine the impact of students' perceptions of more flexible learning spaces on learning and engagement compared to the traditional spaces. The results demonstrate the importance of incorporating the student's point of view and perceptions when remodeling student spaces. More than 90% of the students that

participated in the study said that the new and more flexible spaces were better than traditional spaces and classrooms, in supporting more collaborative learning and comfort. It was also possible to conclude that this new design also impacts the student motivation, since students reported they were more motivated on their learning in more modern space

The 21st century learning spaces must increase their flexibility, that is, there is no requirement for more physical spaces but an increase of the flexibility in the available spaces (Uduku, 2015). A more flexible space allows students to personalize their experiences, allowing students to have the choice of individual and collaborative learning spaces. The design of new spaces must also be able to reconfigure over time, allow the use of technology, to accommodate the present and future needs (JISC, 2009).

2.4 Learning Space Attributes

Cunningham and Tabur (2012) identify four characteristics that create desirability for a space: access and linkages, uses and activities, sociability and comfort and image. The authors provide a scheme that can be used as a guideline for the design philosophy taking place in a library. This scheme follows Maslow's Hierarchy of Needs theory and clarifies some needs of the users for an ideal learning space.

The users' needs are divided into four levels in a Maslow's pyramid scheme. Each level provides us with ideas and trends for the needs of students, the lowest level of the pyramid is about "access and linkage", which refers to the location, zones, collection, information, and network of the library. The next level is about "uses and activities" that refers to reading, writing, collaborating, and the furniture, equipment, and the flexibility of the space. The level above of the scheme is "sociability" which includes the way the space is use for socializing, for quiet space or noisy, independent and group work. The higher level of the pyramid refers to the "comfort and image" that is about the ambiance and sense of scholarship that the library transmits to is students and the comfort for an ideal learning space. These four levels will be described in the following sections.

2.4.1. Access and linkage

The concept of "access and linkage" is related to the physical space of a library, where students easily move from working in a group to individual work as they develop their activities, switching between writing, studying, and socializing in their highly scheduled and time-constrained days. Therefore, libraries should have sub-spaces or zones intended for different activities, such as quiet study, group work, socializing, eating, mobile phone

Study spaces at ISEG: Enhancing individual study in the library

usage, and computer access. These zones could be delineated by permanent or moveable barriers and by design elements such as furniture or carpet coloration to be easy understood by the users (Delcore et al., 2009; Foster and Gibbons, 2007; Twait, 2009). This study also refers that students in a quiet zone still like to work and study near their colleagues working in a group study space, so individual and quite spaces must be located close to group spaces, or in the same floor.

2.4.2. Use and activities

Students spend many hours in the library therefore this needs to be a comfortable and welcoming place and must be able to meet the needs of students. This requires the creation of different spaces in the library, with specific furniture and equipment, comfortable seating, different tables, printers, whiteboards, making the library more capable to accommodate all the needs of the students (Foster and Gibbons, 2007). Increasing the group spaces, but also create quiet spaces, designing an ideal study space must include quiet areas with noise dampening features (Suarez, 2007). Also, another growing trend in library renovations is, incorporating in the library non-traditional units to fulfill the maximum of student's needs, such as coffee stations, food stations, student's services centers, print centers and other types of units (Shill and Tonner, 2003). Flexibility and modularity are also a new trend in the rethink of library spaces (Acker and Miller, 2005; Bennett and Council on Library and Information Resources, 2005). A library must be able to reconfigure quickly to meet the daily needs of students and student's groups, giving the students the possibility to temporally customize the space as need arise and then quickly rearranged to accommodate the next group of students (Foster and Gibbons, 2007).

2.4.3. Sociability

Sociability is also an important part of a library, going to a library to study and work, is a choice to be in a place where you can interact and socialize, so libraries must take in account this side of the users (V. Cunningham and Tabur, 2012). Despite students choose a social place to work, study or reading, different students have different needs for quiet, privacy and social inclusion, so when designing a library, we must create a "communal library" for a quiet study an independent study, and a "social library" for collaborative group work and socialize (Gayton, 2008). These different areas are not exclusive, group study spaces are also used many times for individual study (Bryant et al., 2009), as mention above students want to near their colleagues, even if their colleagues are doing

Study spaces at ISEG: Enhancing individual study in the library

a different work or in a different area, seeing other students doing similar work is a strong motivation that make students choose the library, also students want to build relationships with other students and the library is also great meeting point for students.

2.4.4. Comfort and image

Comfort and image are the highest attribute in the scheme and the most difficult attribute to define. The comfort and image of a learning place such as a library is a crucial attribute that motivates students to use the libraries as their option to work read and study, and guarantee usage of the library space in the future (V. Cunningham and Tabur, 2012). There is a strong positive correlation between the quality of the ambiance and comfort of a library and its usage by students, the quality of user workspace and the quality of the layout increase the usage of the library (Shill and Tonner, 2003). Another important fact referred on this topic of comfort and image is the preference of the students for natural light in the spaces, in design exercise students allows refer the natural light as an important part of the design of a study space (Delcore et al., 2009; Foster and Gibbons, 2007; Twait, 2009). The display of artwork is another important aspect mentioned by students in their feedback about the study spaces, artwork displayed is particularly valued by students (Bennett and Council on Library and Information Resources, 2005; Delcore et al., 2009; Loder, 2010).

2.5 Libraries Models

Jochumsen (2018) addresses how the different research-based approaches can contribute to qualify and support the debate on the organization of a library and talks about two popular models that have been discussed and implemented in libraries, the “Four-space model” and “Three-function model”.

According to the Four-space model, the design and organization of a library must support four main goals: “Experience”, “Involvement”, “Empowerment”, “Innovation” and it should be divided in four different spaces, a “inspiration space”, “learning space”, “meeting space” and “performative space”. By doing division of spaces and connecting them with different roles makes the physical space more attractive and relevant even in the new digital age.

The Three-function model addresses how libraries can contribute to city and community development in different ways, as a place, as a space and as a meeting point for creating relations. As a place the library can be involved in the urban development of

a city, as a space can enhance a creative and innovative city, by being a space for experiences and meetings, and as meeting point how a library can create new relations, connections, and transformations through new creative partnerships.

The Four-space model is more in line with the goal of this project, so it will be explore with more detail in the next chapter. The Three-function model is must more focus on how a space can create more relations between its users, which is not the main goal of this project

2.6 .The Four-space model

Libraires are facing many challenges, from digitalization to new patterns of library use that creates new needs for from its users. This model reflects how a library should transform to new times, going from place with focus on collections of books and information to a more active space for experiences and inspiration where people can meet and socialize. The four-space model can be a useful guideline to rearranging libraries (Jochumsen et al., 2012).

According to the four-space model, the design of a library must support four main goals: “Experience”, “Involvement”, Empowerment” and “Innovation”. The first two goals, experience and involvement, are more related to the individual perception and identity of each person in the society. The third goal, empowerment, is more concerned with the opportunity for users to acquire new skill and tools to succeed in society, Lastly, the innovation goals refers to in giving people new answers to problems and developing new methods and concepts (Jochumsen et al., 2012).

These four main goals call for the creation of four different spaces: “inspiration space”, “learning space”, “meeting space” and “performative space” that can support each other to fulfill the library main objectives (Jochumsen et al., 2012).

2.6.1.Inspiration space

The inspiration space must be a space that can support the goals of innovation and experience, a space that can create meaningful experiences that inspire people. Libraries have always been a space of inspiration, associated with learning throughout its book collection. However, it is necessary to expand this source of inspiration and create more community experiences that can inspire people, create more events, gatherings, and activities in the library to complement all the media and book collection that a library

have. This will require an open and flexible space that can be used for events that can inspire people. The library can also be an inspiring experience with a good interior design, creating a space with a vibrating color scheme and themed based design to simulate its users (Jochumsen et al., 2012).

2.6.2.Learning space

The learning space is a space that underpins the goals of experience and empowerment. It allows users to gain and increase their knowledge, skills, and competences by giving them unrestricted access to information. While the classic libraries' learning space is a quiet reading room that provides access to information, in this new digital age the learning space must be a flexible space that recognizes different learning styles and accommodates a variety of modern sources of information. Furthermore, the students' learning activities are not exclusively related to university, they are also based on interests' students might have developed from their life situations. Hence, the library must be an ideal space to learn about all types of interests. (Jochumsen et al., 2012)

2.6.3.Meeting Space

The meeting space is a space supporting the goals of empowerment and involvement. Libraries usually have a meeting room, but most of the time it is just an empty space. Nowadays, it is necessary to transform this meeting space on a more dynamic area. There are a few numbers of public meeting spaces where students can be together, and thus the meeting space must be a space with a design for formal meeting but also a space for social gathering, that is, a space that can be used for scheduled or spontaneous meetings. The libraries should provide small and private spaces for small group meetings as well lounge areas with tables and different sitting arrangements, supported with coffee facilities to accommodate a variety of meetings (Jochumsen et al., 2012).

2.6.4.Performative Space

The performative space underpins the goals of involvement and innovation and is based on the idea that the library must also be a place for making things. In the performative space users can interact with others and have access to a variety of tools to support the work of each user. This space may be equipped with a variety of equipment from craft tables, video editing stations, printers, and 3-D printers, allowing users to practice and create audio, video, text, visual art, and digital content. It must extend the

role of the library and be a place where media, information, knowledge, and entertainment are created (Jochumsen et al., 2012).

CHAPTER 3. METODOLOGY

3.1 Research Context

3.1.1. The Lisbon School of Economics and Management (ISEG)

The study was conducted at the Lisbon School of Economics and Management (ISEG). ISEG is a public university currently located in the center of Lisbon, and is part of the country's biggest university, University of Lisbon, that is currently the number 1 university in Portugal. Founded in Portugal, in 1911, ISEG was the first school of economics and management in Portugal. ISEG's mission is to develop, share and improve the social and economic value of knowledge and culture in the fields of economics, finance, and business sciences. At the end of the academic year 2021/2022, ISEG had approximately 5400 students with over 40 different nationalities, across the various courses. Currently ISEG has 8 Undergraduate programs, 22 Masters' programs, 6 PhD programs and a various number of executive education programs and an MBA (ISEG, 2023a).

ISEG aims to stay aligned with the United Nations Sustainable Development Goals (SDGs), with the objective of improving and expanding the work done on SDG-related issues by integrating sustainability throughout the organisation, from educational programmes to campus, community and partnerships (ISEG, 2023).

ISEG is recognized at the international level by international educational entities and is among the top 5% of Business Schools that are accredited worldwide by AACSB (Association for Advance Collegiate Schools of Business), a global association that accredited the best business schools that assures a quality business education. ISEG is also recognized by international rankings such as the Financial Times, with some of its courses and programs scoring high. ISEG's MBA (Master of Business Administration) is accredited by AMBA (Association of MBAs), the highest standard for an MBA (ISEG, 2023).

The campus of ISEG as mentioned above is in the center of Lisbon, between Lapa and the Assembly of the Republic, where it moved in 1911 to an old convent of the English

Study spaces at ISEG: Enhancing individual study in the library

Bridgettine Order, that has ceded to the Higher Institute of Commerce at the time, that later became the Lisbon School of Economics and Management (ISEG).

Today the campus is composed of 5 core buildings, the Quelhas Building, that has the site of the old Bridgettine Order convent, that was fully renovated and today is where Postgraduate and Master's classes are taking place, the Bento de Jesus Caraça Building, where are located the offices of the various departments, professors, and research centers. Francesinhas Buildings that are 2 similar buildings, Francesinhas I and Francesinhas II, where undergraduate students have classes and the place of some ISEG offices and other services, like food services, a cafeteria and ISEG's main canteen. Finally, to complete ISEG campus, the Francisco Pereira de Moura Library Building, that has named in memory of the former ISEG professor, Francisco Pereira de Moura. (ISEG, 2023b)

3.1.2. ISEG's Library

ISEG's Library is considered one of the most important in Portugal in the subjects of economics, business, math, sociology, history, and law. Due to the historical factor, the ISEG's Library was founded with the inauguration of the school in 1911 and was situated inside the Quelhas building and due to the diversity of its collections and resources (ISEG, 2023c).

Its initial content consisted just of a few hundred books, but today has one of the best collections in the country in the fields of Economics, Management, and Associated Sciences. The library is also integrated in the European Documental Centre, and it is a World Bank copyright library. (ISEG, 2023c)

Today the Francisco Pereira de Moura Library has its own building in ISEG campus, inaugurated in 1998, is a multifloored building with 5 floors, numbered from 0 to 4. The ground floor (0), where the main entrance is, composed of the entrance atrium, a reception and security area, a locker zone, data providers space, exposition areas where some initiatives are organized, and a study room, currently are spaces dedicated to the associations of ISEG, and the "Aquarium" (large study room). (ISEG, 2023d)

The first floor (1) is composed by a reception, an area with tables and chairs for reading and journal consultation and also used to study, catalogue search terminals, a room reserved only for master's students, and a periodic publications archive. (ISEG, 2023d)

Study spaces at ISEG: Enhancing individual study in the library

The second floor (2) is very similar to the first floor, but with more available space for tables and chairs, for reading and book consultation, also this floor has individual reading and workstations, catalog search terminals, and a book archive. (ISEG, 2023d)

The third floor (3) is much smaller in terms of area available, this floor have a smaller area with tables and chairs, but this also has a reception, and a catalog search terminal. The fourth floor (4) is not available for the students, is composed by the library technical staff offices. (ISEG, 2023d)

3.2 Type of Study and Purpose

The purpose of this project is to propose a renovation of the current ISEG's library, more specifically the second and third floor of the library, to adapt the existing spaces to the new needs of students. Examine potential solutions for the challenges reported and provide insights on how the ISEG library can best adapt to cope with the changing times and become a successful study space in the new digital era.

Given the nature and the objectives of this project, it is based on a quantitative research, targeting the ISEG student population and is a cross-sectional study, due to the fact that the data for this project is collected and analyzed in only one specific moment in time.

3.3 Sampling and Data Collection Method

This project is applied to the student population of ISEG studying in the various courses of ISEG, Bachelor's, Master's, PhD's, Executive Education, and MBA programs. This accounts for a population of around 5400 students that were available to be part of this data collection.

The questionnaire used in this study was developed and distributed using Qualtrics, a software platform dedicated to the collection of data. It was shared and disseminated online through social media that were used by ISEG students, with the objective of collecting more responses. The social media networks used were Instagram, via "stories" publications, and by direct message and ISEG student's groups on WhatsApp, between January 29th and February 9th of 2023, and has been able to collect a total of 114 responses from which 76 responses were usable.

3.4 Questionnaire Development

The questionnaire used in this project was developed in collaboration with 2 more colleagues that were working in similar projects related to the renovation of ISEG's

Study spaces at ISEG: Enhancing individual study in the library

library. More specific, the ground floor (0), the alteration of the “aquarium” space into a more flexible space, and another project related to the first floor (1) with the goal of transforming the floor into a collaborative workspace, dedicated to group work and group projects. My project as mentioned previously will focus on the alteration of the second floor (2) and third floor (3), creating different spaces for different types of study and work, more specific, the creation of individual study space and workspace and also a reading area. For this reason, the questionnaire development had in mind the characteristics of these 3 projects related to the ISEG study spaces.

Overall, the questions were inspired by the objectives and goals of the 3 projects being developed and by a benchmark research on libraries across the world and their best practices. The questions were divided into different sections related to the topics and objectives of which projects. It consists of 22 questions, divided by 8 sections of questions.

The questionnaire was written in two languages, English to be able to collect answers from foreign students that are currently studying in ISEG, and also because the master’s program in which this master's final work was developed is in English. Portuguese for the Portuguese students, given the questionnaire the possibility to collect more answers.

The first section gives a brief introduction to the questionnaire and as the objective to filter ISEG students from non-ISEG that are not relevant to this questionnaire, and a question concerning the profile of the respondent in terms of the type of ISEG program. After the first section, there is one concerning general questions about the library that are common to the 3 projects being developed, and the next group of sections is dedicated to the different spaces that were worked in the different projects.

In the section regarding the general questions of the library, the questions were based on the current ISEG study spaces, with the objective to collect data on how the study spaces were being used by the students, the regularity of that use, and what their purpose was, also aiming to understand the importance of key features that are present across the study spaces. Additionally, understand the spaces that need to be updated and, seeking to gather the opinion of ISEG’s students on the importance of creating dedicated study spaces and the usefulness of some features and the implementation of new features to those study spaces.

The following sections of the questionnaire are related to the different spaces of the library, the reading space, group workspace, individual study space, individual workspace, and the ground floor. Taking into consideration that one of the main purposes of this study is to identify a new way of reorganizing the library for the new times, these sections aim to understand the opinion of ISEG students regarding the creation of each of these different zones has mentioned above. Additionally, based on benchmark research, the students are also asked about the implementation of some new features and their importance.

Lastly, the 8th and last section is intended to collect personal information, useful to define the student's profiles and perform a segmentation analysis. The complete questionnaire can be found in Annex A.

CHAPTER 4. EMPIRICAL ANALYSIS

4.1 Introduction

This chapter will present the analysis of answers obtained to the questionnaire sent to ISEG students. The questionnaire gathered answers from 114 participants, but only 76 answers, approximately 67%, were usable on this analysis. From the 114 participants, 8 needed to be excluded from to analysis due to the fact that weren't ISEG students, also 30 participants did not finish the questionnaire or answer all the questions. The data collected from this questionnaire was analyzed using the Qualtrics software and the IBM SPSS Statistics software.

4.2 Sample profile

The sample consists of 76 ISEG students, of which 60.53% are female and the remaining 39.47% are male. In terms of age, the most representative age group is the one between 18 and 24 years, with 85,53%, followed by the age group between 25 and 34 years with 14.47% of the sample. In terms of type of program that students are studying at ISEG, most of students are in a Master's Degree representing 65,79% of the responses, 32,89% are in a Bachelor's Degree and 1,32% in an Executive Education program, the questionnaire didn't collect any answer from PhD and MBA students.

Study spaces at ISEG: Enhancing individual study in the library

Table 1 – Sociodemographic Characterization of the Sample

| Characteristics of the sample (N=76) | Options | N | % |
|-----------------------------------------|---------------------|----|-------|
| Gender | Male | 30 | 39.47 |
| | Female | 46 | 60.53 |
| Age | Under 18 | - | - |
| | 18 – 24 | 65 | 85.53 |
| | 25 – 34 | 11 | 14.47 |
| | 35 – 44 | - | - |
| | 45 – 54 | - | - |
| | 55 or over | - | - |
| Type of program studying at ISEG | Undergraduate | 25 | 32.89 |
| | Master | 50 | 65.79 |
| | PhD | - | - |
| | MBA | - | - |
| | Executive Education | 1 | 1.32 |

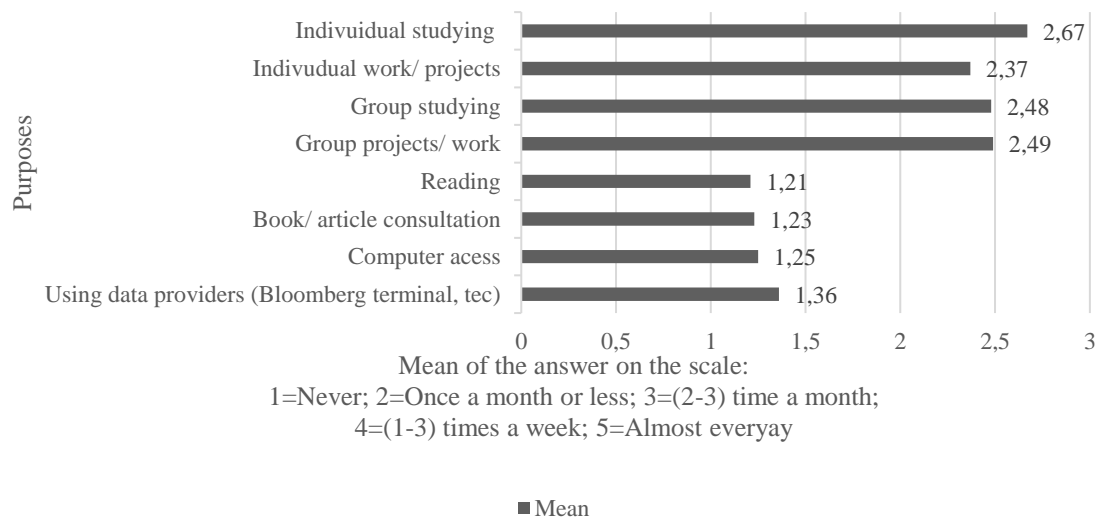
Source: Author

4.3 Analysis of the use of the current ISEG study spaces dedicated questions

One of the first questions of the questionnaire aimed to identify how often ISEG's students use the study places for different purposes (e.g., individual study, computer access). For each purpose, students rated their frequency of use on a scale from 1=Never to 5=Almost everyday. By analyzing the mean of the responses, we can see that the study spaces are mainly used for individual study (mean= 2.67), group work and projects (mean=2.49), group studying (mean=2.48), and individual work and projects (mean=2.37), respectively, as illustrated bellow. The average of the responses leans between the second and third level, meaning that they use the ISEG study spaces for these purposes between once a month to 2-3 times a month. However, there are some percentage of students that use these spaces at least 1-3 days a week to almost every day, (30,27%) for individual Study, 17,11% for Individual projects, 22,67% for group work, and 14,48% for group studying (combining the percentage of answer that include 1-3 days a week and almost every day). The study spaces that are less used by the respondents for reading (mean=1.21), consulting books and articles (mean=1.23), computer access (1.25), and data providers like the Bloomberg terminal, as illustrated in the graph below (Graph 1)

Study spaces at ISEG: Enhancing individual study in the library

Graph 1 – Use and purposes of ISEG study spaces

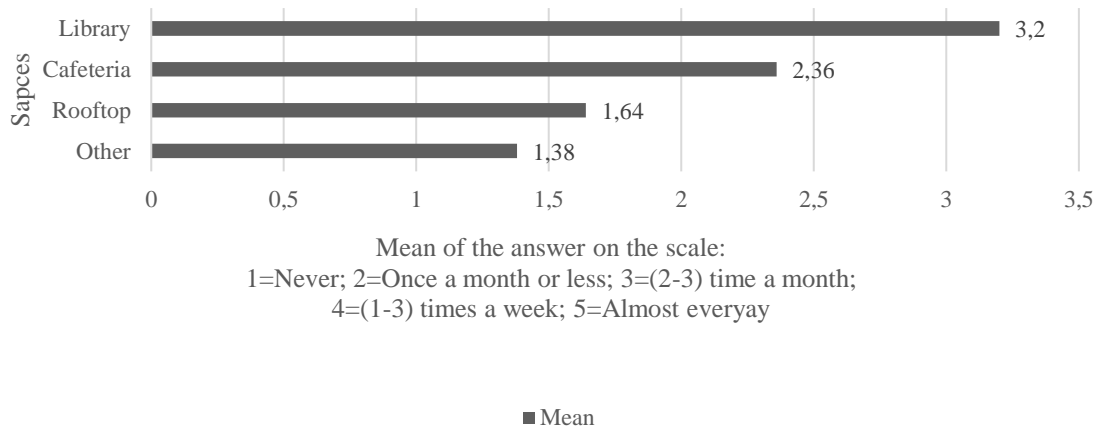


Source: Author

Additionally, the questionnaire aimed to identify the space in the ISEG campus students the frequency of use of different study spaces, on a scale from 1=Never to 5=Almost everyday. The place used more often has the library with a (mean=3.20), as illustrated below (Graph 2), that leans between the third and fourth levels, meaning students use the library 2-3 times a month to 1-3 days a week, with 28,00% of the students using this space almost every day. Following this the students were asked specifically about the ISEG library to try to understand the most frequently used areas inside the library. The results collected in these questions demonstrate that the library floors are the most frequently used in the library, with an average of responses that fell into the third level (mean=2.83), meaning its usually used 2-3 times a month or more by the students, followed by Aquarium space, and then the master's room, as illustrated bellow (Graph 3).

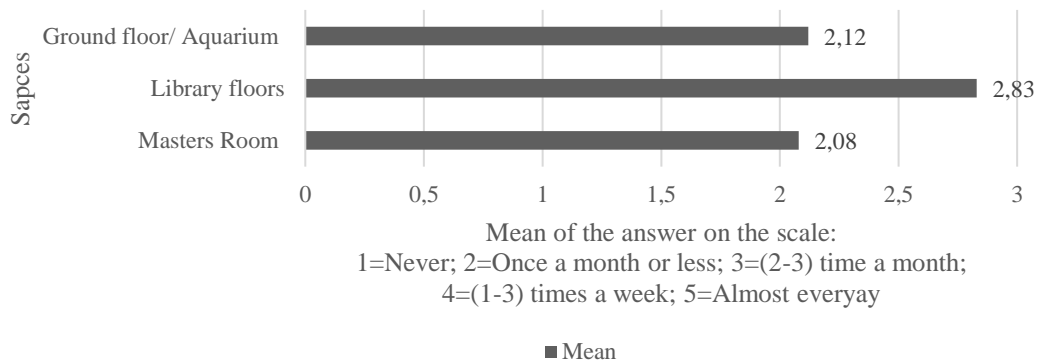
Study spaces at ISEG: Enhancing individual study in the library

Graph 2 – Use of ISEG campus spaces to study



Source: Author

Graph 3 – Use of ISEG library spaces

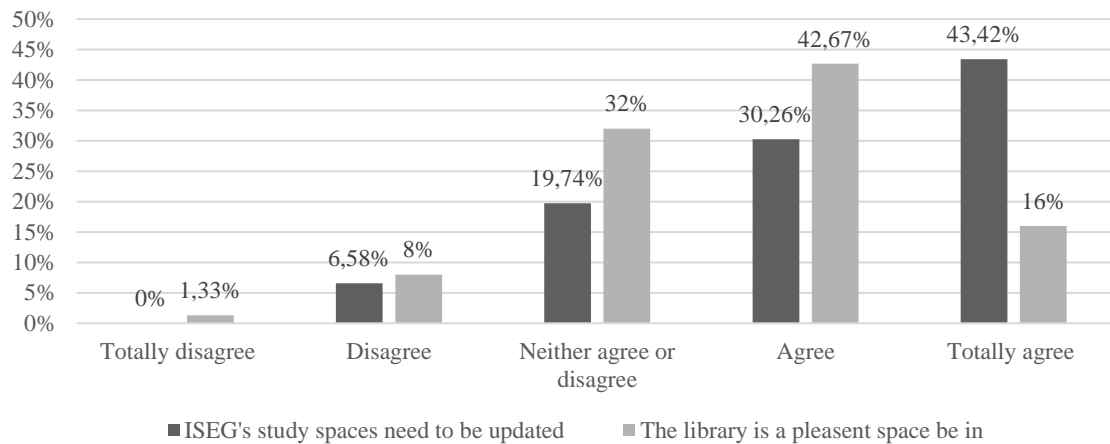


Source: Author

When asked about how they feel about the ISEG's study spaces conditions, the majority of students agreed with the affirmation that the study spaces need to be updated, 43,42% totally agreed, and 30,26% agreed. Additionally, they were also asked if they find the current spaces of the library a pleasant space to be, 16% totally agreed and 42,67% agreed with the affirmation, which means the library is still a pleasant space to be, but 32% neither agreed nor disagreed with the affirmation, as illustrated below (Graph 4).

Study spaces at ISEG: Enhancing individual study in the library

Graph 4 – State of the ISEG Study Spaces



Source: Author

The creation of dedicated spaces for the different purposes of students was also present in the questionnaire. When confronted with these questions, the students found really important the division of spaces, based on the needs of the different purposes. The majority of the answers lean into very important or extremely important when asked about the importance of the different study spaces, the individual study space, with 64,47% of the participants considering it an extremely important space, and the group workspace with 60,53%, the individual workspace has also considered an important space, with 40,79% answering extremely important, as illustrated in the table below (Table 2).

Table 2 – Importance of dedicated study spaces

| Options | Mean | Not at all important | Slightly important | Moderately important | Very important | Extremely important |
|-------------------------------|------|----------------------|--------------------|----------------------|----------------|---------------------|
| Individual workspace | 4,12 | - | 3,95% | 21,05% | 34,21% | 40,79% |
| Multipurpose space | 3,92 | 1,33% | 6,67% | 25,33% | 32,00% | 34,67% |
| Individual study space | 4,49 | - | 2,63% | 6,58% | 30,26% | 60,53% |
| Groupwork space | 4,53 | - | 2,63% | 6,58% | 26,32% | 64,47% |
| Reading space | 3,36 | 1,32% | 25,00% | 32,89% | 18,42% | 22,37% |

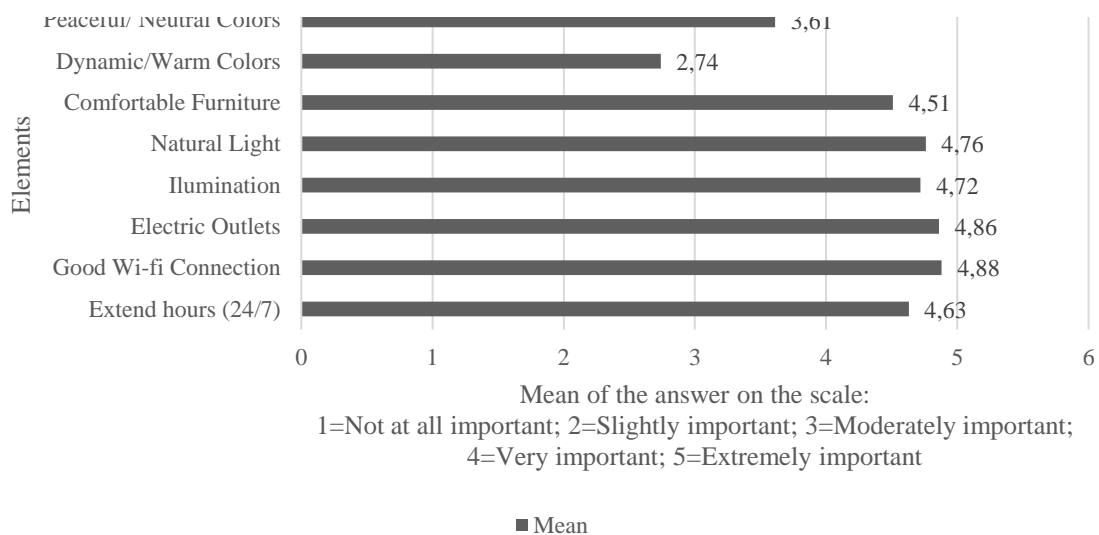
Source: Author

In terms of the key elements and features of the study spaces, most of the elements presented in the general section of questions were considered very important or extremely important by the participants. The average mean of the answer is above 4.5 for most elements. The extremely important elements considered by the students that responded to this questionnaire for a modern study space are the Electric outlets (mean=4.86) and a good Wi-Fi connection (mean=4.88), followed by a good illumination

Study spaces at ISEG: Enhancing individual study in the library

of the space, being that artificial (mean=4.72) or natural (mean=4.76) illumination, a study space with extended hours was also considered by the participants has a necessary feature for a good study space, with 73.69% considered it as an extremely important element, comfortable furniture also as considered an extremely important feature with 60.84% of the responses. In terms of the color for a study space, the respondents demonstrated that they prefer more peaceful and neutral colors (mean=3,61) to dynamic and warm colors, and with a (mean=3,61), the answer leans between the moderately and very important, meaning that is an element with some relevance for a study space, illustrated below (Graph 5).

Graph 5 – Importance of study space elements and features

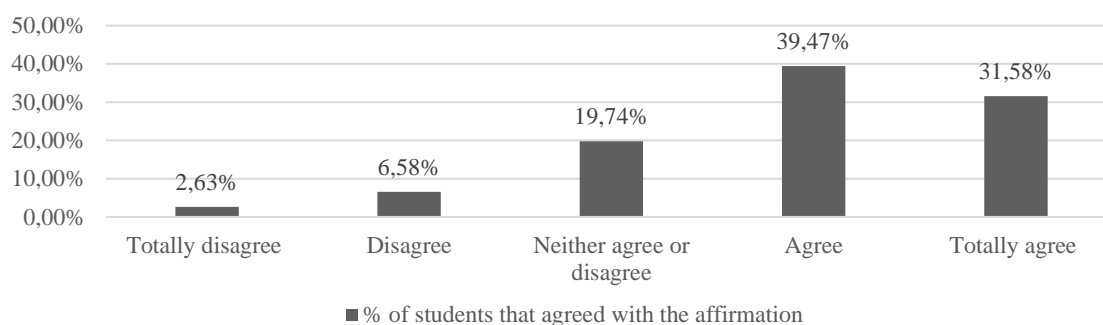


Source: Author

Additionally, to these elements, the students were also asked on a scale from 1=Totally disagree to 5=Totally agreed about the importance of including green features across the different areas and how it might improve the spaces overall, like adding green panels with plants in the walls of the library. The answers had a mean of 3.91 which leans into the fourth level, the majority of the participants considered this an important feature to add, 39,47% agreed with the affirmation, and 31,56% totally agreed with the affirmation that the study space might be improved by adding green features, as illustrated below (Graph 6).

Study spaces at ISEG: Enhancing individual study in the library

Graph 6 – Green elements in study spaces



Source: Author

The following table illustrates the new types of features that ISEG could implement to improve the study spaces and the answers collected from the respondents in terms of the importance of adding these new features, on a scale from 1=Not at all important to 5=Extremely important. The results show as the most appreciated new feature would be the possibility to see the seat occupation online via the ISEG's app, with 61,84% answering that would be an extremely important feature, followed by the possibility to book a spot in the library via ISEG app, with the majority of the respondents answering that would be a very important (38,16%) or extremely important (42,11%) feature, followed by the necessity to have access to printers, a significant number of respondents considered this feature extremely important (40,79%). Lastly, the possibility of having a second monitor to connect a portable computer had mixed answers, with an average mean of (3.21) which leans into the third level of moderately important feature to be included in the library, as illustrated below (Table 3).

Table 3 – New features for the ISEG Library

| Options | Mean | Not at all important | Slightly important | Moderately important | Very important | Extremely important |
|------------------------------------------------------------------------------------|------|----------------------|--------------------|----------------------|----------------|---------------------|
| Being able to book a spot for you/ your group in the library via ISEG's app | 4,09 | 5,26% | 2,63% | 11,84% | 38,16% | 42,11% |
| Being able to see the library's seat occupation online/ via ISEG's app | 4,45 | 1,32% | 2,63% | 7,89% | 26,32% | 61,84% |
| Having access to a second monitor for your PC | 3,21 | 7,89% | 26,32% | 26,32% | 15,79% | 23,68% |
| Having access to printers | 3,95 | 2,63% | 10,53% | 17,11% | 28,95% | 40,79% |

Source: Author

4.4 Analysis of the reading space dedicated questions

In this section, the questionnaire aimed to understand what features would be appreciated and most useful for the students in a space dedicated to reading and consulting books, articles, and other forms of information, on a scale from 1=Not at all useful to 5=Extremely useful. When asked about having more comfortable and appropriate for this dedicated reading area, the mean of answers lean into the fourth level (mean=4.07), being considered by the respondents a very useful feature, however a significant number of respondents considerate an extremely useful feature (40,79%), the participants also considerate useful to have digital kiosks to consult and request books in ISEG’s Library instead of the traditional bookshelves, with a mean of 3.97 the answer leans in the fourth level of a very useful feature to have. Lastly, the feature considered more important was having an appropriate and adjustable illumination, with a mean of 4.57 and 65,79% of the participants considering it an extremely useful feature, as illustrated in the table below (Table 4).

Table 4 – Reading space features

| Options | Mean | Not at all useful | Slightly useful | Moderately useful | Very useful | Extremely useful |
|---------------------------------------------------------------------------------------------|------|-------------------|-----------------|-------------------|-------------|------------------|
| More comfortable and appropriate furniture | 4,07 | 2,63% | 5,26% | 15,79% | 35,53% | 40,79% |
| Digital kiosks to consult/request books in ISEG’s Library instead of the bookshelves | 3,91 | 2,63% | 6,58% | 22,37% | 34,21% | 34,21% |
| Appropriate/ ajustable illumination | 4,57 | 1,32% | - | 5,26% | 27,63% | 65,79% |

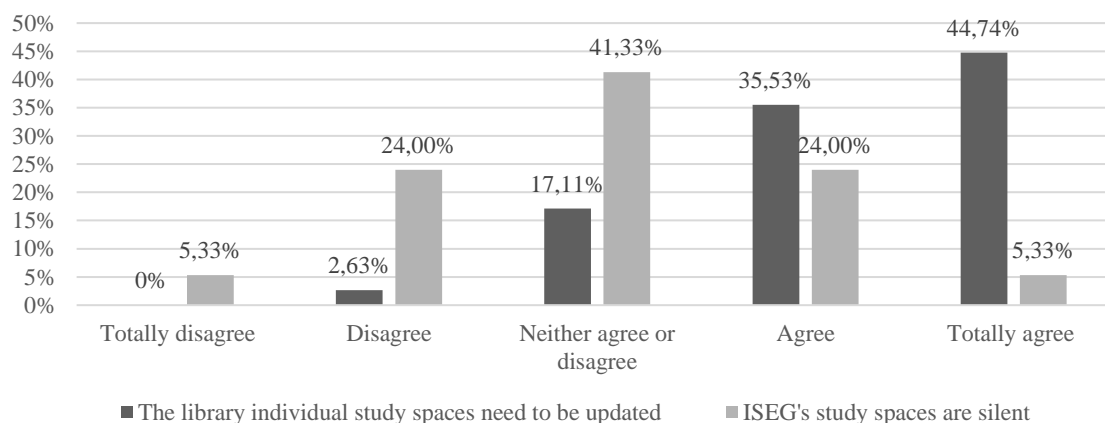
Source: Author

4.5 Analysis of the individual study space dedicated questions

In the section dedicated to the individual study spaces, the questionnaire aimed to understand what has the opinion of the respondents on the current conditions of the current individual study space in the ISEG library, on a scale from 1=Totally disagree to 5=Totally agreed. Of the 76 respondents, 35.53% agreed, and 44,74% totally agreed with the necessity of updating the ISEG individual study spaces, and when asked if the ISEG study spaces were silent, 24,00% disagreed with the affirmation and 41,33% neither agreed nor disagreed with the affirmation, revealing a lack of a quiet space, as illustrated in the graph bellow (Graph 7).

Study spaces at ISEG: Enhancing individual study in the library

Graph 7 – State of the ISEG individual study spaces



Source: Author

To understand what features could be important to have in an individual study space, the respondents were asked about the importance of some features on a scale from 1=Not at all important to 5=Extremely important, aiming to find which they consider more important to have in ISEG. Having comfortable furniture in an individual study space was selected by 72,37% of the respondents as an extremely important feature to have, followed by a silent environment with the majority of respondents also considering an extremely important feature (65,79%), the individual and adaptable illumination has also considered an extremely important feature with 64,47% considering extremely important. The individual study booth that was presented in a picture on the questionnaire was considered out of the four features the least important, however still considered a very important element to have in an individual study space, with a significant number of respondents (40,79%) considered a very important feature to have, as illustrated in the table below (Table 5).

Table 5 – Individual study space features importance

| Options | Mean | Not at all important | Slightly important | Moderately important | Very important | Extremely important |
|-----------------------------------------------------------------------|------|----------------------|--------------------|----------------------|----------------|---------------------|
| Individual study booths like the ones presented on the picture | 3,87 | 1,32% | 9,21% | 19,74% | 40,79% | 28,95% |
| Silent environment | 4,57 | - | - | 9,21% | 25,00% | 65,79% |
| Comfortable furniture | 4,64 | - | - | 7,89% | 19,74% | 72,37% |
| Individual/ adaptable illumination | 4,58 | - | - | 6,58% | 28,95% | 64,47% |

Source: Author

Study spaces at ISEG: Enhancing individual study in the library

4.6 Analysis of the individual workspace dedicated questions

In the section dedicated to the individual workspace, the respondents were asked about the importance of some features on a scale from 1=Not at all important to 5=Extremely important, aiming to its utility in a dedicated workspace in the ISEG library. The most useful feature according to respondents is the access to printers with a mean leaning to the fourth level of very useful (mean=3.88), followed by the creation of a specific area in the library to access data providers like for example the Bloomberg terminal (mean=3,76), was also considered by the students has a very useful feature, with 0% of the respondent considering this feature as not at all useful, the access to a second monitor for the portable computer and the requestable portable computer was considered moderately useful with a mean of 3.25 and 3.21, respectively, but with a considerable number of respondents considered very and extremely useful feature as illustrated in the table below (Table 6).

Table 6 – Individual workspace features usefulness

| Options | Mean | Not at all useful | Slightly useful | Moderately useful | Very useful | Extremely useful |
|--------------------------------------------------------------------|------|-------------------|-----------------|-------------------|-------------|------------------|
| Requestable portable computer (laptop) | 3,21 | 10,53% | 17,11% | 32,89% | 19,74% | 19,74% |
| Access to a second monitor for your PC | 3,25 | 7,89% | 18,42 | 32,89% | 22,37% | 18,42% |
| Access to printers | 3,88 | 2,89% | 7,89 | 19,74% | 38,16% | 31,58% |
| Specific area for data providers (Bloomberg terminal, tec.) | 3,76 | - | 7,89 | 31,58% | 36,84% | 23,68% |

Source: Author

4.7 Analysis of differences

A t-test was conducted to analyze if there were significant differences according to the students that responded to the questionnaire related to the program, they were studying in ISEG and the gender. For the program the majority of the answers were from Undergraduate and Master students, and in the gender questions only to groups responded to the questions, being those groups the more relevant to be compared in this analysis. Differences were considered to be significant when $p < 0.05$ (Marôco, 2021). Tables 1, 2, 3 and 4 in the Annex B show the results for the variables where significant difference were found.

As far as program is concern, were found three differences, on the 1 to 5 scale questions, relevant to this study, for the question “How often do you use ISEG’s study paces for each of these purposes” the variable “computer access” and “using data

Study spaces at ISEG: Enhancing individual study in the library

providers”, for the questions “When studying at ISEG library how often you use this areas” the variable Library Floors.

For the variable related to the computer access, a Master Student use more the spaces for computer access (mean=1,37) than an Undergraduate student (mean=1,04), the same tendency flows to the use of data providers like the Bloomberg terminal, the Master students that responded in this questionnaire use more the data providers in ISEG library (mean=1,46) compared to the Undergraduate students (mean=1,16). In terms of the more used areas in the ISEG library the variable concerning the library floors, the Undergraduates use the space must more often that the master students, with a mean of 3,32 compare the Master students of 2,62, respectively, as illustrated in the table below (Table 7).

Table 7 – Differences of mean concerning student program

| Question | Program | N | Mean |
|-----------------------------------------------------------------------------------------------|---------------|----|------|
| How often do you use ISEG’s study spaces for each of these purposes? - Computer Access | Undergraduate | 25 | 1,04 |
| | Master | 49 | 1,37 |
| How often do you use ISEG’s study spaces for each of these purposes? - Data Providers | Undergraduate | 25 | 1,16 |
| | Master | 50 | 1,46 |
| When studying at ISEG’s library how often you use these areas? - Library Floors | Undergraduate | 25 | 3,32 |
| | Master | 50 | 2,62 |

Source: Author

As far as gender is concern, were found five differences, on the 1 to 5 scale questions, relevant to this study, for the question “How important do you think having these spaces in a university is” the variable “individual study space” and “multipurpose space”, for the questions “how important do you think having these elements are in a study space” the variable “natural light”, lastly for the question “On the scale presented, how important are the following elements regarding the individual study” in the variable “silent environment” and “comfortable furniture”.

For the variable individual study space, the students of the female gender, felt more the importance of having an individual study space (mean=4,65) compared to the male students (mean=4,23), the tendency followed to the multipurpose space, the mean for the female students was 4,11 compared to male student of 3,62. In terms of the importance that some elements have in a study space, the natural light was consider much more important for the female students (mean=4,87) compared to the male students

Study spaces at ISEG: Enhancing individual study in the library

(mean=4,57). Lastly, when asked about importance of some elements regarding an individual student space, the importance of a silent environment the mean for the female students was 4,72 compared to male student of 4,33, the female students that responded to this considered a much more important element, the same tendency also flowed for the comfortable furniture, the female considered again a much more important element to have (4,80) then the male students (mean=4,40).

Overall, the female students consider all of the spaces and elements above much more important than the male students, analyzing the man of the answers, they are leaning into the fifth level of extremely important, compared the male answers were some le more into the fourth level of very important, as illustrated in the table below (Table 8).

Table 8 – Differences of mean concerning the student gender

| Question | Program | N | Mean |
|-------------------------------------------------------------------------------------------------------------------------------------|---------|----|------|
| How important do you think having these spaces in a university is? – Individual Study Space | Male | 30 | 4,23 |
| | Female | 46 | 4,65 |
| How important do you think having these spaces in a university is? – Multipurpose Space | Male | 29 | 3,62 |
| | Female | 46 | 4,11 |
| How important do you think these elements are in a study space? – Natural light | Male | 30 | 4,57 |
| | Female | 46 | 4,89 |
| On the scale presented, how important are the following elements regarding the individual study? – Silent environment | Male | 30 | 4,33 |
| | Female | 46 | 4,72 |
| On the scale presented, how important are the following elements regarding the individual study? – Comfortable furniture | Male | 30 | 4,40 |
| | Female | 46 | 4,80 |

Source: Author

CHAPTER 5. CONCLUSIONS

The purpose of this chapter is present the conclusions of this study, establishing parallelisms between the data collected in the questionnaire and the literature reviewed. and present potential solutions to the challenges addressed in this study on how the ISEG library can best adapt to cope with the changing times and can become a dynamic hub in the campus and be successful in an increasingly digital world.

5.1 Summary of the questionnaire results

Through the quantitative analysis of the questionnaire, it was possible to evaluate that the library of ISEG is the main space used by the students to study in the ISEG campus, reaffirming that the library still maintains an important learning and social role in this new digital age. It was also possible to conclude that the spaces are mainly used to study and work, and not to access books or information, which reinforces the necessity described in the literature to adapt the study spaces to these new purposes, the availability of information online gives the physical space of the library a lot more significance (V. Cunningham and Tabur, 2012).

The main purposes for what the study spaces are used, particularly in the library, are the individual study, the development of group works and projects, followed by group studying and also the development of individual work and projects. These four main purposes have different characteristics and needs, reinforcing the importance of redesigning the spaces to accommodate all these purposes, highlighting the importance of the libraries' design taking into consideration the needs of the users and focus on the aspects that cannot be replaced by digital technology (Jolly and White, 2016; Li et al., 2018). It was also possible to conclude that the ISEG study spaces need to be upgraded, despite the students consider it a pleasant space to be, the majority of students feels that the spaces are outdated, reinforcing the goal of this project, to give information n how the library could adapt the existing spaces to the new needs of students. The the library must be a comfortable place to be, as mentioned in the literature a “third place” between the work or classroom and home, were students like to work and study, either alone or together, it's important that a library offers an informal and comfortable environment where they can meet, study and work (Gemma, 2016).

The creation of different dedicated spaces was also seemed by the students that participated in this project as extremely important, reinforcing the idea spread across the

literature that libraries should have sub-spaces or zones dedicated for different activities and purposes such as quiet space for study, a space for group work, a space for socializing, eating, mobile phone usage, and computer access. An idea also present in the four-space model that calls for the creation of four different spaces, a “inspiration space”, “learning space”, “meeting space” and “performative space” each one dedicated to different activities and purposes.

This project also tried to identify the key elements and their importance for the students in a study space and the results obtained support previous studies. The comfort of space is very important in a modern library for the students, reinforcing the study of (Shill and Tonner, 2003) about the quality of the ambiance and comfort of a library and it’s positive correlation with its usage by the students, quality of the layout increase the usage of the library. The natural light must be an important aspect to be consider when redesigning a study space, reaffirming the studies of (Delcore et al., 2009; Foster and Gibbons, 2007; Twait, 2009) that students have a preference for natural light in study spaces. Was also identified in the questionnaire that a good illumination is a very important aspect to be consider when designing a study space, together with good connectivity. Given that the use of digital devices increased, the study spaces must ensure a good wi-fi connection along with sufficient number of electric outlets, supporting the study of (Gemma, 2016) that mentions 21th century libraries must ensure good and innovative lighting techniques to make the space more comfortable and attractive along with good connectivity. Additionally, the results obtained in the questionnaire also shows the necessity of extending the open hours of the library, this was also identified as a key element to have in a modern library.

A preference for peaceful, neutral colors was also noted, which according to the literature reviewed for this project can give spaces a more peaceful atmosphere (Mehta and Zhu, 2009), and in some cases awaken creativity (Ceylan et al., 2008). In addition to the use of peaceful colors the use of green features across the difference spaces of the library, was also very well received by the students.

The results obtained also indicated the importance of some new functionalities that can be implemented at ISEG, such as the possibility to book group booths, to see the occupation of the seats through the ISEG application, to have a close access to printers and the possibility to work in the library with a second monitor.

5.1.1. Creation of a reading space

In terms of the creation of an area dedicated to reading, in the literature review several authors expressed its importance in a library. According to Gemma (2016) reinventing the spaces to read its necessary to create an attractive spaces to read in the library, with the easy access to printed books and e-books. Through empirical data analysis, were identified in the questionnaire some features that need to be improved in the current spaces, such as the placement of better and adaptable lighting, the placement of more comfortable furniture for reading and finally the introduction of digital kiosks to request books and e-books.

5.1.2. Creation of an individual study space

The results obtained in this project also demonstrate the need to update individual study spaces, most students feel they need to be renovated, and the results obtained also demonstrate there is a lack of quiet space in the library solely dedicated for individual activities. Something referred in the literature review as an important space, according to Suarez (2007), it is important to create quiet spaces, designing an ideal study space must include quiet areas with noise dampening features.

These ideas are further reinforced by the results regarding the elements that students consider important to have in a space dedicated to individual study. More comfortable furniture adapted to the purpose of the space, followed by the need to create a quiet environment for study. Good illumination should also be an important point when designing an individual study space. The placement of individual study booths was also seen by the students as a good element to complement a space dedicated to individual study.

5.1.3. Creation of an individual workspace

With the empirical analysis of the data collected for this study, it was possible to identify the importance and utility of some elements that may be present in such a space. As mentioned above, this space should contain several tools that allow students to develop their projects, was also identified the access to printers as a very useful element to incorporate in a space like this, followed by the creation of a sub space reserved for data providers such as the Bloomberg terminal, to allow access to information for the students. Also, access to a second monitor to connect to the laptop, was considered a useful element, along with the ability to request a portable computer instead of a fixed one.

Study spaces at ISEG: Enhancing individual study in the library

The creation of an individual workspace in the ISEG library relates to the performative space of the four-space model of Jochumsen et al. (2012), a space dedicated to work where users can interact with others and have access to a variety of tools to support the work of each user.

5.2 Proposed solutions for the redesign of the ISEG library

After consulting the literature on the subject, , the empirical analysis of the results collected in the questionnaire, and the establishment of parallelisms between the data collected and the concepts of the literature reviewed. This part of the study aims to present the ideas and potential solutions for the second and third floor of the library, to adapt the existing spaces to the new needs of students.

The potential solutions presented here will refer to the creation of three spaces in the ISEG library, spread over floors two and three of the building. The creation of a space dedicated to reading, a space dedicated to individual study and a space dedicated to work on individual projects and assignments.

As mentioned in the empirical analysis of the results, the students who participated in the questionnaire for this project consider the creation of dedicated areas for different purposes to be very important. Was also mentioned in the literature that the library must be capable to accommodate all the needs of the students and their different purposes when using the study spaces, this requires the creation of different spaces, each one with specific furniture and equipment (Foster and Gibbons, 2007). The creation of an individual study area as well as the creation of an area for individual work were seen as one of the most important areas to add to ISEG's current library. Also, the creation of a dedicated area for reading and consultation of books was seen as an important addition.

As mentioned throughout this project, the role of the libraries has changed, from traditional repositories of books and other physical materials to dynamic hubs. The access to information online is increasing the importance of the library as a physical space. For this reason, libraries all around are being redesign to a space for people gather, work and study instead of a place to store books. This is the philosophy that the ISEG's library needs to flow to be more attractive. Currently nearly half of the library's floor space is occupied by bookshelves, this space should be reduced. As observed in the result obtained in the questionnaire (Graph 1) few people use the library to consult books, the space occupied by the bookshelves should be used for other purposes. This solution is also

mentioned in the literature reviewed, in the study made by Gemma (2016), mentioning that libraries with lack of space should reduce the number of stacks of books and create more space for people to meet and creating alternatives for the access to books.

This is the first step in the project, reorganize the bookshelves in the ISEG library and to introduce design concepts that allow to create a better harmony with the space, making it more attractive and freeing space. The current organization of rows of high bookshelves should be replaced by a more intelligent way of organizing them, replacing some with low bookshelves, reducing visual obstructions on the floors and allowing for more visibility to the whole space and allowing better entry of natural light, a very important element for students in a study space as mentioned above in this project. Tall bookshelves should be used next to walls or to serve as space dividers. It is also very important to make these bookshelves more attractive, helping the rest of the space also become more appealing. Adopting good and innovative lighting techniques, like adding LED lighting to bookshelves adds more appeal to the books, this practice is already used in other libraries across the world, the Varnamo Public Library in Sweden (Annex 3 – Image 1) is one example where this practice was adopted.

Add green elements to the study space, such as walls of plants to the current library spaces at the ISEG, is also a solution to improve the spaces. Most students that responded to the questionnaire considered it to be something that improves the environment of the space, making the study areas more pleasant to be. These green elements should also be combined with neutral colors, giving the spaces a more peaceful atmosphere and in some cases boosting the creativity, as mentioned in the literature reviewed (Ceylan et al., 2008).

5.2.1. Proposed solutions for a reading space

As already mentioned many times in this project, libraries have become a place to study, socialize and work, but there is also a need for a quiet space for students that need a quiet environment to read. Also, with the removal and reorganization of bookshelves, it is necessary to implement a new space dedicated to books, a reading space. According to the reviewed literature is important to reinvent the spaces to read, with the easy access to printed books and e-books, it's necessary to build attractive spaces to read in the library (Gemma, 2016).

This space should be created with comfortable furniture suitable for reading, replacing the current tables and chairs not very comfortable with sofas suitable for reading and with

Study spaces at ISEG: Enhancing individual study in the library

adjustable lighting for a comfortable reading (Annex 3 – Image 2), placing attractive bookshelves with LED lighting to make the space more appealing for reading also the installation of digital kiosks to consult and request books in ISEG's Library allowing a reduction in the number of bookshelves and more modern and easy research for books.

5.2.2. Proposed solutions for an individual study space

There is also a need in today's libraries for a quiet space, a space dedicated for students that like to study alone and need a quiet environment, according to the results of the questionnaire, the study spaces of ISEG were not considered by the majority of respondents as quiet spaces, reinforcing the need to create this space. Some important elements to include in a space like this were identified with benchmark research and literature review, which were then corroborated as important elements by the students who participated in the questionnaire of this project.

It is important to ensure a quiet environment by incorporating soundproofing materials in the design of the space, as referend previously, designing an ideal study space must include quiet areas with noise dampening features (Suarez, 2007). Also, the students who answered the project questionnaire considered it a very important element. The current furniture in the library should be replaced by more comfortable and modern furniture that ensures adequate connectivity to the students, such as access to more electric sockets to allow charging of computers and electronic devices for all the students, something that the current tables do not allow, the placement of dividers at the tables that seat several students, to give more comfort to the students in their individual study (Annex 3 – Image 3).

The act of study is not only carried out at tables and chairs, so it should also be explored the possibility of including in this space another type of more comfortable furniture like some sofas that support the study (Annex 3 – Image 4). Adequate and adjustable lighting should also be guaranteed in this space to give more comfort to the students, this was also an element considered as very important by the students that participated in the questionnaire.

A growing trend that has been seen in other libraries is the placement of individual study booths, these booths are soundproofed to ensure a quiet environment and guarantee more privacy for students who intend to study alone and need silence to concentrate

(Annex 3 - Image 5). These individual study booths should also ensure good connectivity for electronic devices, as well as ensuring good lighting as already mentioned.

5.2.3. Proposed solutions for an individual workspace

The creation of an individual workspace in the ISEG library as mentioned above relates to the performative space of the four-space model of Jochumsen et al. (2012) reviewed in the literature of this project, a space dedicated to work on projects where users can have access to a variety of tools to support their work. space Also identified in the questionnaire as another important space to be added to the ISEG Library.

The aim of this space is to give students an area where they can work on assignments and projects that are often requested during the school year. A space with a calm environment and equipped with tools that can support any work to be developed. The access to printers, allowing students to print the documents they need to study or work on the projects, the creation of a dedicated space for data providers was also considered important, a sub-space with a comfortable layout and computers to access this data providers.

Another important element to consider in this space will be the placement of second monitors on the tables (Annex 3 – Image 6), allowing students to connect their laptops and work with 2 monitors increasing their productivity. Also, the possibility of requesting a laptop instead of the current fixed computers is a solution to consider, this solution increases the flexibility of the space, mentioned in the study of (Omolola A. et al., 2017) as important part of the 21th century study spaces, with this option of request a portable computer students are free to sit wherever they want or together with their colleagues, mentioned in an article shared by (V. Cunningham and Tabur, 2012), students study or working in a quiet zone still like to work and study near their colleagues.

5.3 Proposal of new blueprints

Based on the solutions presented above, it's present below a proposal for a new layout of the spaces, on floors 2 and 3 of the ISEG library. The individual study and individual workspaces would be allocated to the second floor of the ISEG library building. The shorter side of the second floor would be dedicated to the individual study, the bookshelves would be removed and placed more tables, with more electrical sockets and with better illumination, as described above, additional would also have areas with some

Study spaces at ISEG: Enhancing individual study in the library

sofas making the space more comfortable and giving different options to students to study, as illustrated in the figure below (Figure 1).

The remaining floor area would be used for individual workspace, more tables, with more electrical sockets and with better illumination would also be added with the removal of the current bookshelves. Individual study booths would be added in this space as well, along with tables with monitors giving students the possibility to connect their laptop and work with two screens. Additional areas with sofas, giving students more comfortable options to work. An area for access to data providers would also be created, along with a support zone with printers, as illustrated in the figure below (Figure 1.). The blueprint can also be found in the Annex 4, figure 1.

The reading space would be allocated to floor 3 of the library, this floor ensures a good natural light throughout the floor, added to the fact that it is a smaller floor which allows for a greater control of noise and become a quiet space for reading. This floor, as identified in the figure below (Figure 2), would have bookshelves to make available the most recent and relevant literature for students to borrow and consult, along with support tables for students who want to study or work and need to consult books. Additionally, this space would have two areas with comfortable furniture and a good and adjustable illumination for students who wish to read. The blueprint of the reading space can also be found on the Annex 4, figure 2.

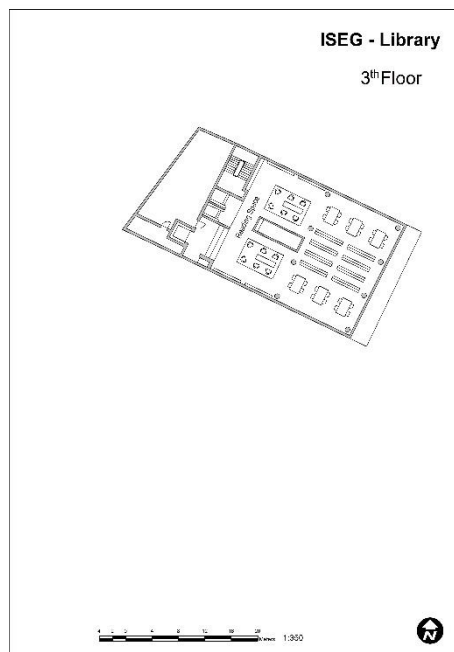


Figure 1 – Third floor – Reading space

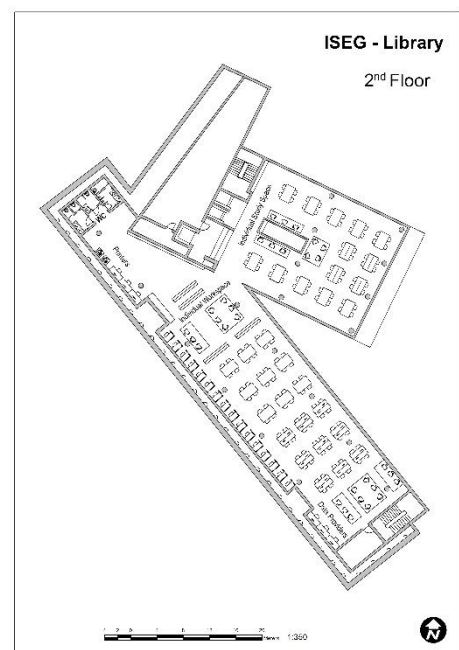


Figure 2 - Second floor - Individual study space and workspace

5.4 Limitations and future research

In terms of the limitations encountered in this project, I would like to highlight the difficulty in accessing some literature, many articles related to the topic were not publicly available. With access to more online article platforms, subscribed by the university would be possible to review more articles on the topic of the project.

The lack of adherence to the questionnaire was another difficulty found in this project, the results were worked on a small sample of students and not very diversified in terms of programs, we had zero responses from PhD and MBA students, and from Executive Education students we only had one valid response for analysis. With more time available for the data collection perhaps it would be possible to collect more responses from ISEG students. The use of a qualitative method would also be an interesting data collection by conducting interviews with students or focus groups, it would give us a more detailed view of the students' opinions regarding the conditions at ISEG in terms of spaces to study and work.

Additionally, the fact that the questionnaire was developed for 3 projects limited the number of questions for each of the projects. The development of a specific questionnaire for this project, would allow more questions to be asked, enabling more information to be gathered for the project. For fear that respondents would not finish the questionnaire due to its length, the number of questions were limited.

Also due to the nature of this project, involving the redesign of the ISEG library spaces, it would have been interesting to carry out this project together with students or people connected to interior design, allowing better solutions to be presented and much better adapted to the library spaces.

REFERENCES

- Acker, S. R., & Miller, M. D. (2005). *Campus learning spaces: Investing in how students learn*. EDUCAUSE Center for Applied Research Bulletin, (8^o ed)
- Bennett, S., Council on Library and Information Resources (Eds.), 2005. *Library as place: rethinking roles, rethinking space*, CLIR. Council on Library and Information Resources, Washington, DC.
- Bryant, J., Matthews, G., Walton, G., 2009. *Academic libraries and social and learning space: A case study of Loughborough University Library, UK*. J. Librariansh. Inf. Sci. 41, 7–18. <https://doi.org/10.1177/0961000608099895>
- Ceylan, C., Dul, J., Aytac, S., 2008. *Can the office environment stimulate a manager's creativity?* Human Factors and Ergonomics in Manufacturing 18, 589–602. <https://doi.org/10.1002/hfm.20128>
- Delcore, H.D., Mullooly, J., Scroggins, M., 2009. *The Library Study at Fresno State*. Institute of Public Anthropology California State University, Fresno, CA.
- Foster, N.F., Gibbons, S. (Eds.), 2007. *Studying students: the Undergraduate Research Project at the University of Rochester*. Association of College and Research Libraries, Chicago.
- Gayton, J.T., 2008. *Academic Libraries: "Social" or "Communal?" The Nature and Future of Academic Libraries*. J. Acad. Librariansh. 34, 60–66. <https://doi.org/10.1016/j.acalib.2007.11.011>
- Gemma, J., 2016. *Designing Libraries in the 21st Century, Lessons for the UK*.
- JISC, 2009. *How Innovative Technologies are Influencing the Design of Physical Learning Spaces in the Post-16 Sector*.
- Jochumsen, H., 2018. *How to Qualify the Debate on the Public Library by the Use of Research-Developed Tools*. Bibliothek Forschung und Praxis 42, 344–350. <https://doi.org/10.1515/bfp-2018-0041>

Jochumsen, H., Hvenegaard Rasmussen, C., Skot-Hansen, D., 2012. *The four spaces – a new model for the public library*. *New Library World* 113, 586–597. <https://doi.org/10.1108/03074801211282948>

Jolly, L., White, S., 2016. *Communication, Collaboration, and Enhancing the Learning Experience: Developing a Collaborative Virtual Enquiry Service in University Libraries in the North of England*. *New Review of Academic Librarianship*. 22, 176–191. <https://doi.org/10.1080/13614533.2016.1156002>

Kamaruzzaman, S.N., Ahmad Zawawi, E.M., 2010. *Employees' Perceptions on Color Preferences Towards Productivity in Malaysian Office Buildings*. *J. Sustain. Dev.* 3, p283. <https://doi.org/10.5539/jsd.v3n3p283>

Li, L.H., Wu, F., Su, B., 2018. *Impacts of Library Space on Learning Satisfaction – An Empirical Study of University Library Design in Guangzhou, China*. *J. Acad. Librariansh.* 44, 724–737. <https://doi.org/10.1016/j.acalib.2018.10.003>

Loder, M.W., 2010. *Libraries with a Future: How Are Academic Library Usage and Green Demands Changing Building Designs?* *College & Research Libraries* 71, 348–360. <https://doi.org/10.5860/crl-37r1>

Marôco, J., 2021. *Análise Estatística com o SPSS Statistics*, 8th ed.

Mehta, R., Zhu, R. (Juliet), 2009. *Blue or Red? Exploring the Effect of Color on Cognitive Task Performances*. *Science* 323, 1226–1229. <https://doi.org/10.1126/science.1169144>

Omolola A., A., Parker, L.C., N. Henke, J., D. Burgess, W., 2017. *Student Perceptions of a 21st Century Learning Space*. *Journal of Learning Spaces* 6.

Savavibool, N., Gatersleben, B., Moorapun, C., 2018. *The Effects of Colour in Work Environment: A systematic review*. *Asian Journal of Behavioural Studies* 3, 149. <https://doi.org/10.21834/ajbes.v3i13.152>

Study spaces at ISEG: Enhancing individual study in the library

Shill, H.B., Tonner, S., 2003. *Creating a Better Place: Physical Improvements in Academic Libraries, 1995–2002*.

Suarez, D., 2007. *What Students Do When They Study in the Library: Using Ethnographic Methods to Observe Student Behavior*, 8.

Twait, M., 2009. *If They Build It, They Will Come: A Student-Designed Library*. College and Research Library News, 4.

Uduku, O. (2015). *Spaces for 21st-century learning*. Routledge handbook of international education and development, 196-209.

V. Cunningham, H., Tabur, S., 2012. *Learning space attributes: reflections on academic library design and its use*. Journal of Learning Spaces, 1.

ISEG, (2023) *About ISEG Lisbon School of Economics and Management*. [online] <https://www.iseg.ulisboa.pt/about/> [Retrieved: 2023/12/02].

ISEG, (2023) *Study ISEG Lisbon School of Economics and Management*. [online] <https://www.iseg.ulisboa.pt/study/> [Retrieved: 2023/12/02].

ISEG, (2023) *Campus ISEG Lisbon School of Economics and Management*. [online] <https://www.iseg.ulisboa.pt/pt/campus-iseg/> [Retrieved: 2023/12/02].

ISEG, (2023) *Library ISEG Lisbon School of Economics and Management* [online] https://www.iseg.ulisboa.pt/aquila/unidade/DDI/sobre/biblioteca?_request_checksum_=6b973867c7275e54e8ce824a2593375a362074af [Retrieved: 2023/12/02].

ISEG, (2023) *Facilities ISEG Lisbon School of Economics and Management*. [online] https://www.iseg.ulisboa.pt/aquila/unidade/ddi/sobre/biblioteca/espacos?_request_checksum_=0e32748e15599e590208b53f31dbec28e9fda189 [Retrieved: 2023/12/2].

Study spaces at ISEG: Enhancing individual study in the library

United Nations. (2023). *SDG 4 - Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all* [online]
<https://sdgs.un.org/goals/goal4> [Retrieved: 2023/03/13].

United Nations. (2023). *SDG 10 - Reduce inequality within and among countries* [online]
<https://sdgs.un.org/goals/goal10> [Retrieved: 2023/03/13].

Study spaces at ISEG: Enhancing individual study in the library

ANNEXES

Annex 1 – Questionnaire

Block 1 - Introduction:

Welcome to this questionnaire on study spaces in ISEG.

We are students of the Master in Management, and this questionnaire will be used to carry out our final project. The information provided is strictly confidential and your data will remain completely anonymous. Therefore, we kindly ask you to answer honestly and spontaneously.

Thank you in advance for helping us, Beatriz, Elisa and João.

Q1. Are you a student at ISEG?

- Yes
- No

Q2. What type of program are you studying at ISEG?

- Undergraduate
- Master
- PhD
- ISEG MBA Program
- Executive Education

Block 2 – General Questions

Q3. How often do you use ISEG's study spaces for each of these purposes?

| | Never | Once a month or less | 2-3 times a month | 1-3 days a week | Almost everyday |
|------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Individual studying | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Individual work/ projects | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Group studying | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Group projects/ work | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Reading | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Book/ articles consultation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Computer access | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Using data provides (Bloomberg terminal, etc.) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Q4. When you study in ISEG, how often do you choose these areas?

| | Never | Once a month or less | 2-3 times a month | 1-3 days a week | Almost everyday |
|-----------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Library | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Cafeteria | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Rooftop | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Q5. When studying at ISEG's Library, how often do you use these areas?

| | Never | Once a month or less | 2-3 times a month | 1-3 days a week | Almost everyday |
|-------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Ground Floor / Aquarium | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Library floors | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Masters' Room | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Study spaces at ISEG: Enhancing individual study in the library

| | | | | | |
|------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Classrooms | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
|------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|

Q6. On the scale presented, how much do you agree with the following affirmations?

| | Not at all important | Slightly important | Moderately important | Very important | Extremely important |
|------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| ISEG's Study Spaces need to be updated. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The Library is a pleasant place to be in | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Q7. How important do you think having these spaces in a university is?

| | Not at all important | Slightly important | Moderately important | Very important | Extremely important |
|-------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Groupwork/ group projects dedicated space | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Individual study space | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Reading Space | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Individual work space | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Multipurpose space | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Q8. How important do you think these elements are in a study space?

| | Not at all important | Slightly important | Moderately important | Very important | Extremely important |
|----------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Peaceful/ neutral colors | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Dynamic/ warm colors | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Comfortable Furniture | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Natural light | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Illumination | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Electric outlets | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Good Wi-fi connection | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Extend hours (24/7 spaces) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Q9. How much do you agree that ISEG's study spaces might be improved by adding green features like those in the image?

- Totally disagree
- Disagree
- Neither agree nor disagree
- Agree
- Totally agree



Q10. How important do you think these features would be in a study space?

| | Not at all important | Slightly important | Moderately important | Very important | Extremely important |
|-----------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Being able to book a spot for you/ your group in the library via ISEG's app | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Being able to see the library's seat occupation online/ via ISEG's app | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Having access to a second monitor for your PC | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Study spaces at ISEG: Enhancing individual study in the library

Having access to printers |

Block 3 (Q11.) - Reading Space:

This block of the survey is dedicated to the part of the Library where you can consult physical books and other paper forms of information and where you can find comfortable furniture and good reading light.

Q12. How useful do you think these features would be in a Reading Space?



| | Not at all useful | Slightly useful | Moderately useful | Very useful | Extremely useful |
|--------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| More comfortable and appropriate furniture like the one in the picture | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Digital kiosks to consult/request books in ISEG's Library instead of the bookshelves | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Appropriate/ adjustable illumination | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Block 4 (Q13.) - Group Work Space:

This block of the survey is dedicated to a part of the Library to develop group projects.

Q14. On the scale presented, how important are the following elements regarding group projects/ groupwork?

| | Not at all important | Slightly important | Moderately important | Very important | Extremely important |
|-----------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Privacy to develop ideias and discuss topics with group members | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Being able to make noise | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Groupwork booths | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Flexible furniture | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Boards to write on/ wall writing surfaces | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Q15. If Groupwork booths (like the one in the image) were to exist in the Library, how important would these elements be?



| | Not at all important | Slightly important | Moderately important | Very important | Extremely important |
|-------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Glass walls for natural light | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Wall writing surfaces | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Study spaces at ISEG: Enhancing individual study in the library

| | | | | | |
|-------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Big table to sit at least six people | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Big monitor with webcam (for teams meetings and training presentations) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Sound proof walls | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Block 5 (Q16.) - Individual Study Space:

This block of the survey is dedicated to the part of the Library where you go to study by yourself.

Q17. On the scale presented, how much do you agree with the following affirmations?

| | Totally disagree | Disagree | Neither agree nor disagree | Agree | Totally agree |
|--------------------------------------------------------|-----------------------|-----------------------|----------------------------|-----------------------|-----------------------|
| The library individual study spaces need to be updated | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| ISEG's study spaces are silent | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Q18. On the scale presented, how important are the following elements regarding individual study?

| | Not at all important | Slightly important | Moderately important | Very important | Extremely important |
|----------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Individual study booths like the ones presented on the picture | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Silent environment | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Comfortable furniture | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Individual/ adaptable illumination | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Block 6 (Q19.) - Performative Space:

This block of the survey is dedicated to the part of the Library where you go to work by yourself, for example on your laptop on individual projects.

Q20. On the scale presented, how useful are the following elements regarding a performative space?



| | Not at all useful | Slightly useful | Moderately useful | Very useful | Extremely useful |
|---------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Requestable portable computer (laptop) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Access to a second monitor for your PC, like one presented on the picture | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Access to printers | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Specific area for data providers (Bloomberg terminal, tec.) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Block 7 (Q21.) - Aquarium:

Study spaces at ISEG: Enhancing individual study in the library

This block of the survey is dedicated to the part of the library found on the ground floor where you can perform individual and group projects and also as room for exams.

Q22. Taking into consideration the following scale, how often do you perform the following activities in the study room?

| | Never | Once a month or less | 2-3 times a month | 1-3 days a week | Almost everyday |
|--------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Study / work alone | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Teamwork projects | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Q23. On the scale presented, what kind of activities do you think you could develop if the wall area of the Aquarium was redesigned to cabinets like those presented in the image?



| | Definitely yes | Probably yes | Might or might not | Probably not | Definitely not |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Studying / Work alone | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Teamwork projects | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Q24. On the scale presented, how much do you agree with the following affirmations regarding the Aquarium?

| | Totally disagree | Disagree | Neither agree nor disagree | Agree | Totally agree |
|-------------------------------------------------------|-----------------------|-----------------------|----------------------------|-----------------------|-----------------------|
| The Aquarium is spacious | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Tables are adequate and chairs are comfortable | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| It is the room that usually has more places available | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Good natural light | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Enough places to charge the computer | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Q25. On the scale presented and considering the furniture in the image, how much do you agree with the following affirmations?



| | Totally disagree | Disagree | Neither agree nor disagree | Agree | Totally agree |
|------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|----------------------------|-----------------------|-----------------------|
| I would change the current furniture (wooden tables and chairs) to one similar to the one presented in the image | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Having individual boards | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Study spaces at ISEG: Enhancing individual study in the library

would help in planning teamwork or as extra support if needed.

This furniture would be easier to move when performing teamwork

With this furniture it is possible to maintain an orderly space and still meet the individual and groupwork needs

| | | | | |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Block 8 – Demographic Questions

Q26. What is your age?

- Under 18
- 18 - 24
- 25 - 34
- 35 - 44
- 45 - 54
- 55 or over

Q27. What is your gender?

- Male
- Female
- Another
- Prefer not to say

Study spaces at ISEG: Enhancing individual study in the library

Annex 2 – Tables

Table 1 - Compared mean (Program)

| Group Statistics | | | | | |
|------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----|------|----------------|-----------------|
| | What type of program are you studying at ISEG. | N | Mean | Std. Deviation | Std. Error Mean |
| | | | | | |
| | Master | 49 | 1,37 | ,994 | ,142 |
| How often do you use ISEG's study spaces for each of these purposes? – Using data providers (Bloomberg terminal, etc.) | Undergraduate | 25 | 1,16 | ,374 | ,075 |
| | Master | 50 | 1,46 | ,762 | ,108 |
| When studying at ISEG's Library, how often do you use these areas? – Library floors | Undergraduate | 25 | 3,32 | 1,249 | ,250 |
| | Master | 50 | 2,62 | 1,427 | ,202 |

Table 2 - T-test on compared mean (Program)

| Independent Samples Test | | | | | | | | | | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------------------|-------|--------|--------|------------------------------|-------------|-----------------|-----------------------|-------------------------------------------|-------|
| | | Levene's Test for Equality of Variances | | | | t-test for Equality of Means | | | | | |
| | | F | Sig. | t | df | Significance | | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | One-Sided p | Two-Sided p | | | Lower | Upper |
| How often do you use ISEG's study spaces for each of these purposes? – Computer access | Equal variances assumed | 11,620 | ,001 | -1,625 | 72 | ,054 | ,108 | -.327 | ,201 | -.729 | ,074 |
| | Equal variances not assumed | | | -2,220 | 55,230 | ,015 | ,031 | -.327 | ,147 | -.623 | -.032 |
| How often do you use ISEG's study spaces for each of these purposes? – Using data providers (Bloomberg terminal, etc.) | Equal variances assumed | 14,886 | <,001 | -1,856 | 73 | ,034 | ,067 | -.300 | ,162 | -.622 | ,022 |
| | Equal variances not assumed | | | -2,287 | 72,997 | ,013 | ,025 | -.300 | ,131 | -.561 | -.039 |
| When studying at ISEG's Library, how often do you use these areas? – Library floors | Equal variances assumed | ,939 | ,336 | 2,084 | 73 | ,020 | ,041 | ,700 | ,336 | ,031 | 1,369 |
| | Equal variances not assumed | | | 2,180 | 54,236 | ,017 | ,034 | ,700 | ,321 | ,056 | 1,344 |

Table 3 - Compared mean (Gender)

| Group Statistics | | | | | |
|----------------------------------------------------------------------------------------------------------------------|----------------------|----|------|----------------|-----------------|
| | What is your gender? | N | Mean | Std. Deviation | Std. Error Mean |
| | | | | | |
| | Female | 46 | 4,65 | ,526 | ,078 |
| How important do you think having these spaces in a university is? – Multipurpose space | Male | 29 | 3,62 | 1,015 | ,188 |
| | Female | 46 | 4,11 | ,948 | ,140 |
| How important do you think these elements are in a study space? – Natural light | Male | 30 | 4,57 | ,626 | ,114 |
| | Female | 46 | 4,89 | ,315 | ,046 |
| On the scale presented, how important are the following elements regarding individual study? – Silent environment | Male | 30 | 4,33 | ,802 | ,146 |
| | Female | 46 | 4,72 | ,502 | ,074 |
| On the scale presented, how important are the following elements regarding individual study? – Comfortable furniture | Male | 30 | 4,40 | ,814 | ,149 |
| | Female | 46 | 4,80 | ,401 | ,059 |

Table 4 – T-test on compared mean (Gender)

| Independent Samples Test | | | | | | | | | | | |
|----------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------------------|-------|--------|--------|------------------------------|-------------|-----------------|-----------------------|-------------------------------------------|-------|
| | | Levene's Test for Equality of Variances | | | | t-test for Equality of Means | | | | | |
| | | F | Sig. | t | df | Significance | | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | One-Sided p | Two-Sided p | | | Lower | Upper |
| How important do you think having these spaces in a university is? – Individual study space | Equal variances assumed | 11,852 | <,001 | -2,497 | 74 | ,007 | ,015 | -.419 | ,168 | -.753 | -.085 |
| | Equal variances not assumed | | | -2,234 | 41,057 | ,016 | ,031 | -.419 | ,188 | -.798 | -.040 |
| How important do you think having these spaces in a university is? – Multipurpose space | Equal variances assumed | 1,131 | ,291 | -2,113 | 73 | ,019 | ,038 | -.488 | ,231 | -.948 | -.028 |
| | Equal variances not assumed | | | -2,080 | 56,635 | ,021 | ,042 | -.488 | ,235 | -.958 | -.018 |
| How important do you think these elements are in a study space? – Natural light | Equal variances assumed | 33,504 | <,001 | -2,992 | 74 | ,002 | ,004 | -.325 | ,109 | -.541 | -.108 |
| | Equal variances not assumed | | | -2,632 | 38,668 | ,006 | ,012 | -.325 | ,123 | -.574 | -.075 |
| On the scale presented, how important are the following elements regarding individual study? – Silent environment | Equal variances assumed | 17,019 | <,001 | -2,571 | 74 | ,006 | ,012 | -.384 | ,149 | -.682 | -.086 |
| | Equal variances not assumed | | | -2,340 | 43,839 | ,012 | ,024 | -.384 | ,164 | -.715 | -.053 |
| On the scale presented, how important are the following elements regarding individual study? – Comfortable furniture | Equal variances assumed | 34,861 | <,001 | -2,883 | 74 | ,003 | ,005 | -.404 | ,140 | -.684 | -.125 |
| | Equal variances not assumed | | | -2,529 | 38,299 | ,008 | ,016 | -.404 | ,160 | -.728 | -.081 |

Study spaces at ISEG: Enhancing individual study in the library

Annex 3 – Images

Image 1 – Varnano Public Library Sweden



Image 2 - University of Birmingham – United Kingdom



Image 3 – Tables with dividers



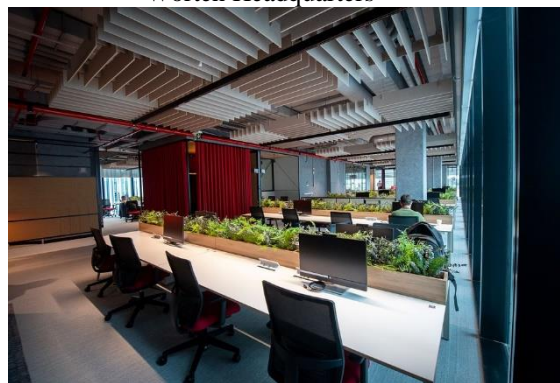
Image 4 – University of Birmingham – United Kingdom



Image 5 – Individual Study Booth - University of Birmingham – United Kingdom



Image 6 – World Trade Center Lisbon – Worten Headquarters



Annex 4 – Blueprints

Figure 1 – Blueprint of the second floor

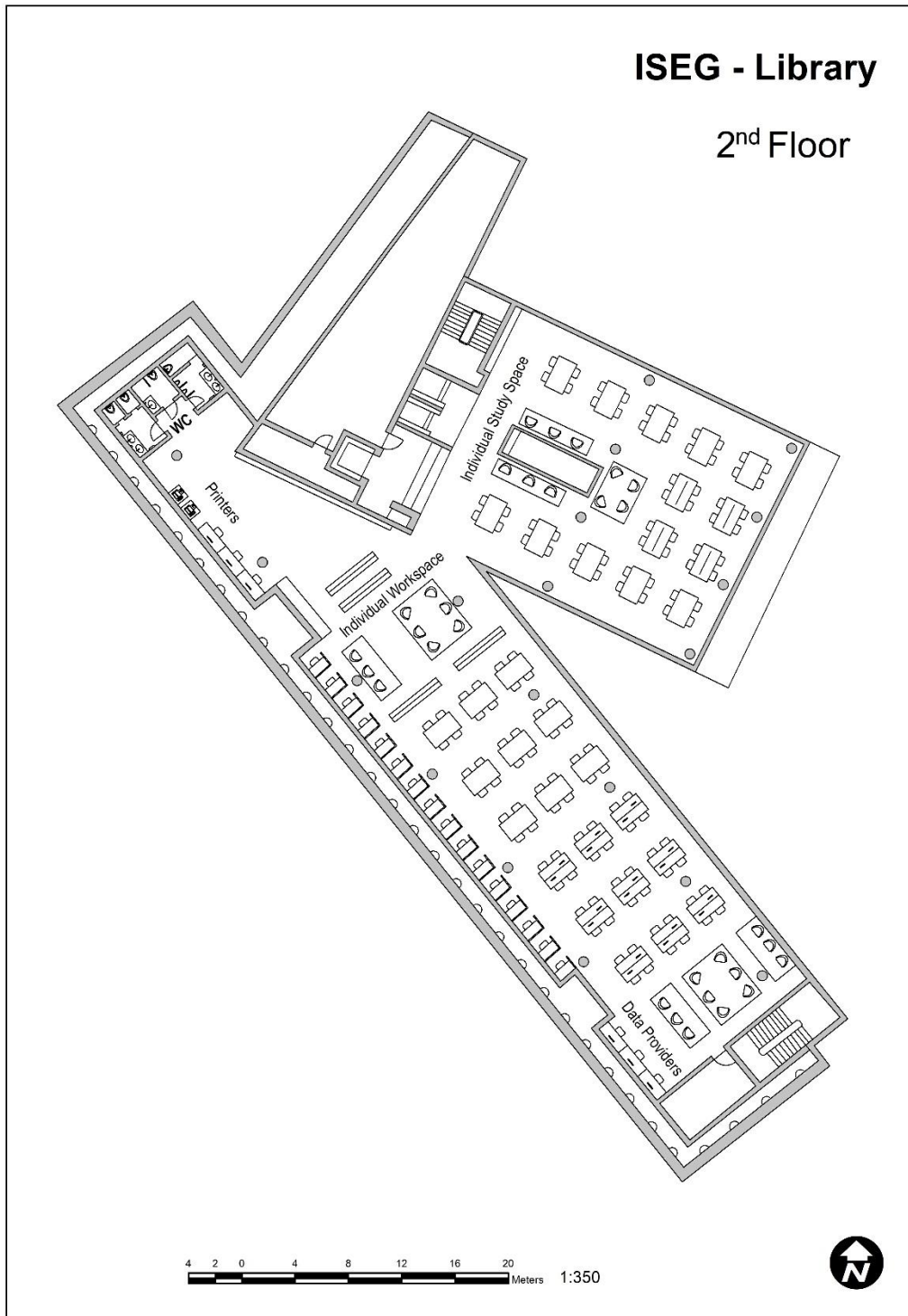


Figure 2 – Blueprint of the third floor

