Report Users' Perspective Analysis

Project Result 2 - Users' perspective analysis: usage, perception, and impact of informal learning spaces

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Introduction

Sapienza is one of the oldest Italian universities, founded in 1303 by Pope Boniface VIII. In the seven centuries since its foundation, it has been at the centre of the history of Rome and the entire country; first as a university linked to the Popes, then as an autonomous Studium Urbis, gradually extending its academic prestige to new disciplines, both scientific and humanistic, and moving from its seat in Trastevere to the Sapienza building in the Sant'Eustachio district and then to current Main Campus. Today, thanks to a large campus just a few steps away from Termini central station and several branches in the metropolitan area, Sapienza is a proper research university where you can research and study in all academic areas, placed among the top Italian universities in the main international rankings.

Sapienza currently offers 309 degree programmes (Bachelor's and Master's) - among which over 66 are taught in English - 200 Advanced Professional Courses, over 95 PhDs and 87 specialisation schools. The School of Advanced Studies provides a programme of excellence and free tuition for the best students. Students with an Italian high school score of 100 are exempted from enrolment fees and the bonus is extended if they keep up their good grades. Families who have more than one child enrolled at the university also enjoy a special brothers-sisters bonus. The enrollment is free for students whose ISEE does not exceed 24,000 euros and there will be reductions for students whose ISEE does not exceed 40,000 euros. University services include 48 libraries (four with 24-hour reading rooms), 19 museums, the Ciao and Hello Orientation Offices, a Sort – Orientation and Tutoring Office in each faculty, a Disabled Students Office, the Job Soul Placement Office, and a Public Relations Office. Through the SapienzaSport Centre, our University promotes numerous cultural, social and sports activities to experience the campus, with over 100 thousand square metres of facilities to practice all kinds of sports, the orchestras and choirs of Musica Sapienza, the Theatron project, the web radio RadioSapienza.

Over 30.000 students come from other Italian cities, nearly 11,000 are international students and over 3,500 students a year take part in international mobility programmes. Thanks to a wide network of agreements with universities around the world, Sapienza also provides its

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students many international opportunities, including double degrees, scholarships abroad, internships in European and non-European countries, and international PhDs.

Sapienza is organized into 11 faculties, one School for Advanced Studies, one post-degree School of Aerospace Engineering, 57 departments, as well as numerous research and service centres. The central administration is organized into areas, offices and sectors.

The rectorate is collegiate with a Rector, a Deputy Rector and a group of Assistant Deputy Rectors and delegates with specific competencies, alongside committees and commissions for evaluation, strategic planning, quality and integration of activities, as well as for specific topics.

Sapienza regularly draws up its Gender Balance, an analytical document that provides a detailed description of the gender balance for the three components of the student body, academic staff and technical-administrative staff.

The 2022 Gender Balance confirms the results of previous years, which show a clear majority of the female component, albeit with significant differences for the various members of the community. The female predominance persists for students and technical-administrative staff, but with the same persistence the male component prevails in the academic staff.

Within the document, a chapter specifically analyses how economic resources are used in relation to gender, with a detailed analysis of the distribution of salaries by gender, roles and categories.

The main Sapienza Campus, the “Città universitaria,” was designed by Architect Marcello Piacentini and inaugurated in 1935. It’s a true city within the city where educational activities are integrated with administrative and reception structures, library services and museums.

Besides the historical campus on Piazzale Aldo Moro in the San Lorenzo Neighbourhood, Sapienza has various faculty and department buildings and offices in various areas of Rome,

as well as university centres in other areas of Lazio. In fact, Sapienza has several off campus facilities to provide learning opportunities outside of Rome, in particular in Latina and Rieti.

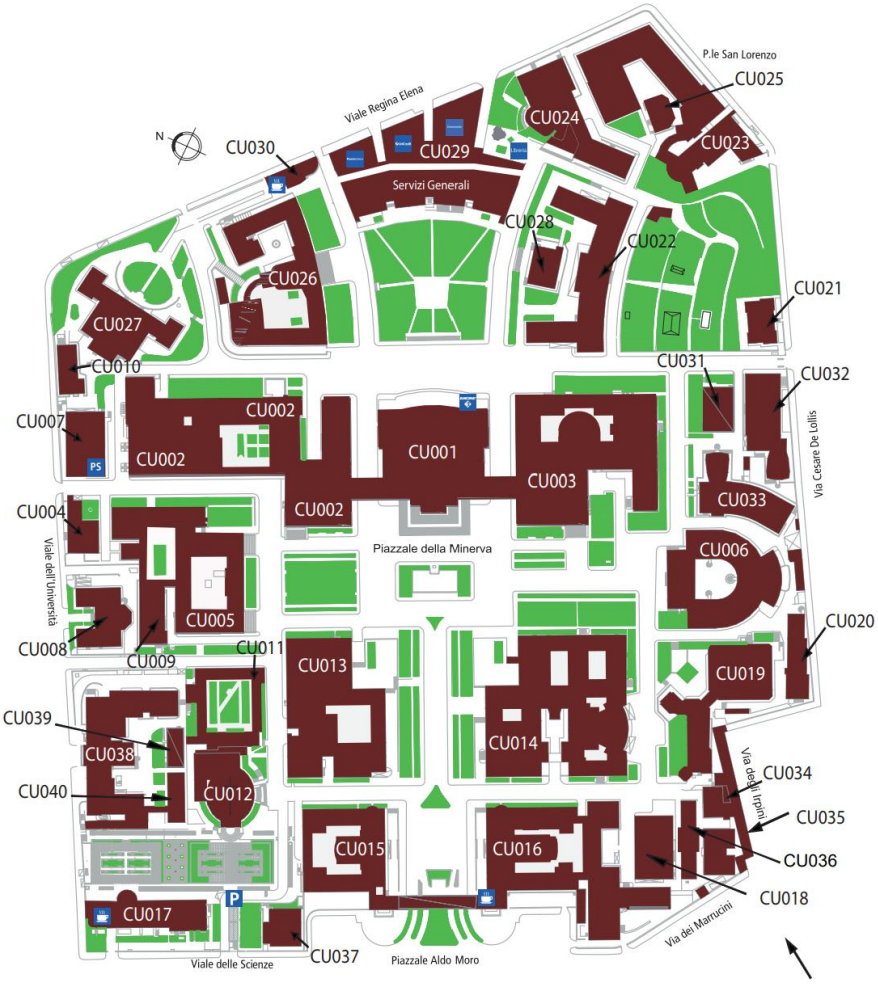

Figure 1. Main Campus Map of Sapienza University of Rome - Plan

Methodology (student survey and focus groups)

The research approach combined quantitative (student survey) and qualitative (focus groups) methods. The investigated variables are in line with the project handbook. Figure 2 below outlines which variables are included in the survey and/or in the focus groups.

Survey (Quantitative method)	**Focus Groups (Qualitative method)**
a) **Availability, accessibility**, spatial characteristics, equipment and use of **informal** or nonconventional **learning spaces by different student groups** (self-developed scale for availability and accessibility)	
b) Analyzing and categorization of users' perceptions and experiences regarding the **fit of learning strategies and learning spaces** (differentiation into focused and collaborative learning)	• In-depth analysis of focused and collaborative learning environments
c) **Impact** of the used informal or non-conventional learning spaces on **students' well-being, knowledge acquisition and university belongingness**	
• **Satisfaction** with campus and knowledge acquisition (self-developed scale) • **Belongingness:** Affective commitment to the university (Allen and Meyer, 1990) • **Interpersonal relations** (French & Oakes, 2004) • **Well-Being:** WHO-5 Well-Being Index (Topp, Oestergaard, Soendergaard & Bech, 2015)	• In-depth analysis of satisfaction with the support and the learning environment
d) Existing **inequalities and barriers** related to informal or non-conventional learning spaces, including access to technical equipment and internet as well as to physical-spatial environments conducive to learning and well-being (self-developed items for barriers)	
	e) **Students' and lecturers' awareness and enabling strategies** to deal with existing inequalities and barriers • Future scenarios regarding hybrid learning and technological support

Table 1: Research approach overview and variables included in the survey and focus groups (self-created, 2023).

Further information regarding the implementation (procedure, instructions and questions) are documented in the survey and in the interview guide for the focus groups (see appendix).

The report is structured as followed:

(1) First, we describe the descriptive results of the student survey.

(2) Secondly, we present the results regarding the hypotheses testing as part of the student survey.

(3) Thirdly, we describe the key findings of the students' and lecturers' focus groups.

Student survey: thematic structure of the survey

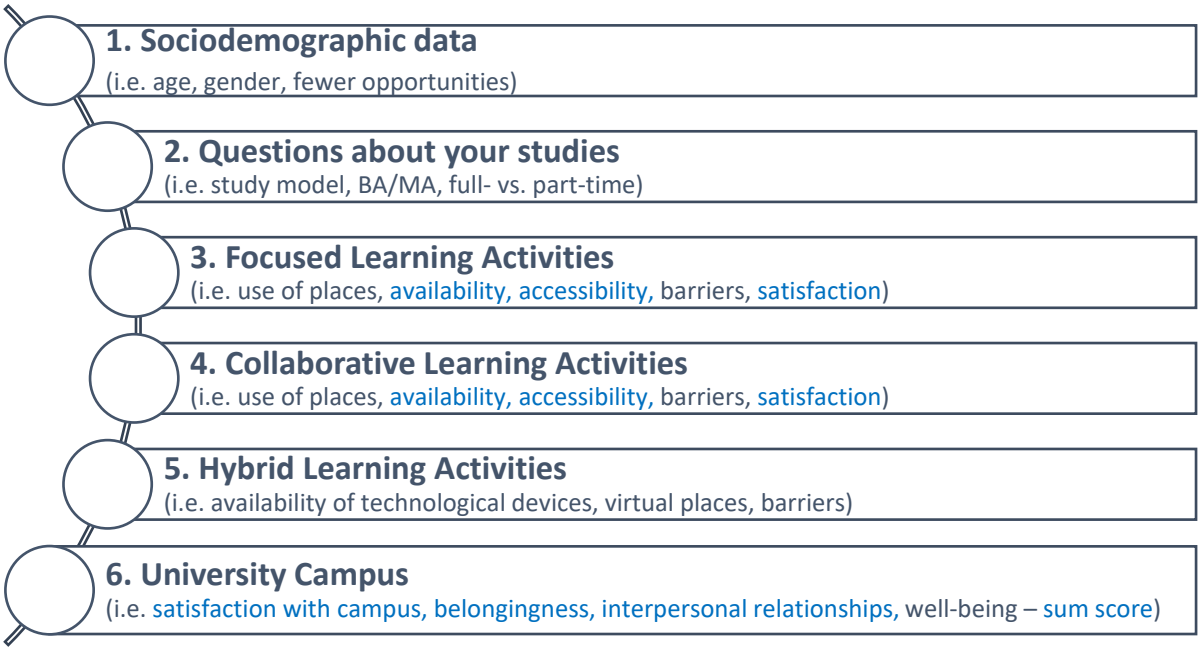

Figure 2: Thematic structure of the survey (blue marked variables are subjective variables which are summarized to a scale after an item and scale analysis) (self-created, 2023).

Descriptive analysis of the student survey

Firstly, data was transferred from the survey tool (Unipark) into a SPSS-file. We added all variable names and questions out of the survey as well as the answering categories for every item into the SPSS file. We checked for missing data and set up the correct scale levels. Coding for most items was aligned and coded in the same direction (e.g. fully agree = 5, fully disagree = 1).

For the central independent variables (availability, accessibility, satisfaction for focused and collaborative learning environments) and central dependent variables (satisfaction, belongingness, interpersonal relations and well-being) we conducted an item and scale analysis and created scales.

In the **item analysis** every item was checked for the following criteria:

- **Mean** between **1,8 and 4,2** (to prevent floor and ceiling effects for five-point Likert scale, all scales except Well-being). Well-being is a **six-point Likert-scale** coded between 0 – 5, the **mean** has to be between **1 and 4** to prevent floor and ceiling effects.
- **Normal distribution**: checked by visual inspection.

- **Corrected item-total-correlation**: between **0,30 and 0,80**

In the **scale analysis** the reliability was measured via **Cronbach´s alpha**. It should be **at least 0,70**.

Sociodemographic data

*At Sapienza, University of Rome in Italy **n=152** students participated in the survey. Sample size may vary between questions since every question did not require a response.*

General sociodemographic data of the participants revealed that **74% identified as female, 24% identified as male, and 2% preferred not to say (1%) or skipped the question (1%).** Regarding participants age, most participants (**62%)** fell between the 21–25-year-old age bracket, with participants up to 20 years old **(12%),** 26-30 years old **(19%)** and above 30 **(10%).** Living conditions of participants indicate that the majority **(79%)** do not live in a household with minor children or persons to take care of.

Students identified their primary living situation as *At a parents'/relatives house* (56%) (*Figure 3*) followed by *Sharing a flat with others* **(24%)**. The remaining options were significantly lower, which is concurrent with the main age of participants.

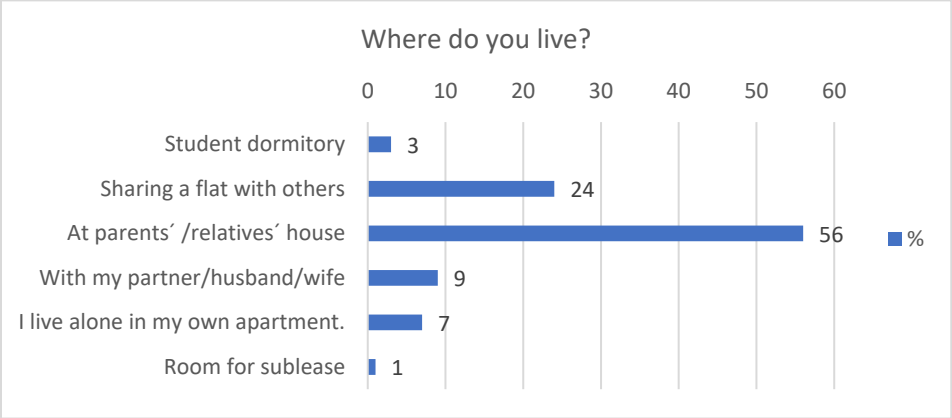

Figure 3: Living situation (n = 152).

In terms of personal obstacles (*Figure 4*), nearly half of the students **(49%),** did not identify as having personal difficulties. However, the most common encountered issues among students **(between 9% and 17%)** were mental disease, language, financial challenges, the need to work

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while studying, and geographic obstacles. While the other difficulties were deemed less impacting reporting between **1%** and **5%** of an issue for students.

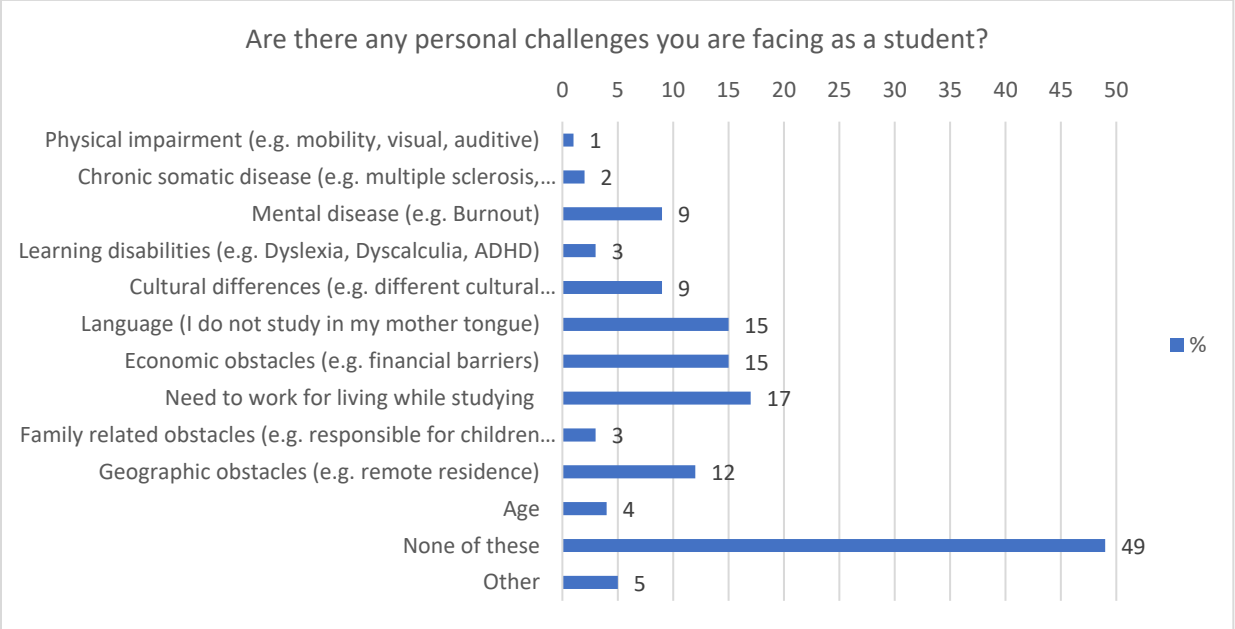

Figure 4: Personal challenges (students with fewer opportunities) (n = 152).

Questions about studies

Students commute between *5-10km* **(35%),** *11-30km* **(22%),** and *0-4km* **(15%)** to university. On average, **9%** of students commute between *31-60km* and *61-100km*, with the remainder commuting more than *100km*.

The greatest number of students **(91%)** study full-time, with the majority holding a Masters **(45%)** and the rest possessing either a Bachelors **(20%)** or a PhD **(5%).** This reflects the general age range of students.

In terms of the *Study Model* that students identify with, the majority are *Studying on campus* **(40%)** or *part-time with regular attendance phases at the university campus* (38%). Fewer students **(10%)** indicated as *participating in Distance learning without on-campus presence offers, Distance learning with on-campus presence offers* **(5%),** or *other* **(7%).**

The amount of time students spend studying was well spread, with most students spending more than 30 hours per week **(31%),** closely followed by 21 - 30 hours per week (25%). Few students **(5%)** spent less than five hours each week.

The year of enrolment for students was greatest in *2021* (**29%**), with student enrolment varying between **13%** and **18%** between *2017* and *2020*. Prior to this, student enrolment was **7%** or less for each year.

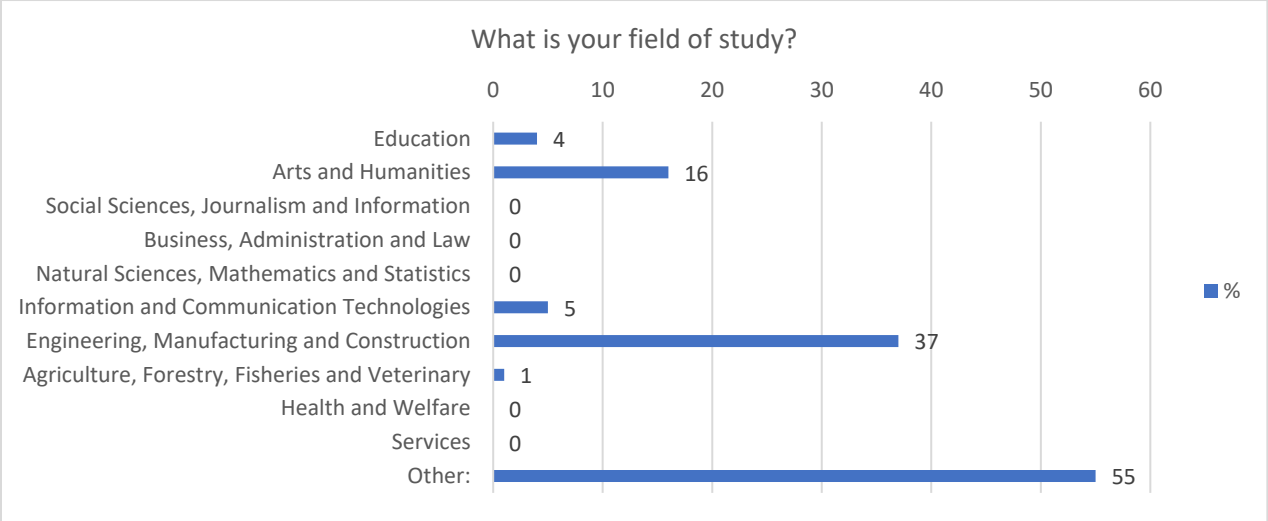

Figure 5: Field of study (n = 152)

It should be noted that, while most students indicated *Other* as their field of study, they also indicated *Architecture* **(40%)** and *Design* (including architecture and *design*, *visual communication and multimedia*, *product*, and *industrial* **(20%).**

Focused learning activities

Students were asked where they completed concentrated learning activities (see Figure 6). The majority of students indicated: "The place where I live" **(mean = 4.2)**. Students utilised *"Temporary Accommodation"* **(mean = 1.4)** and the "University Canteen/Cafeteria" **(mean = 1.6)** the least for concentrated learning activities.

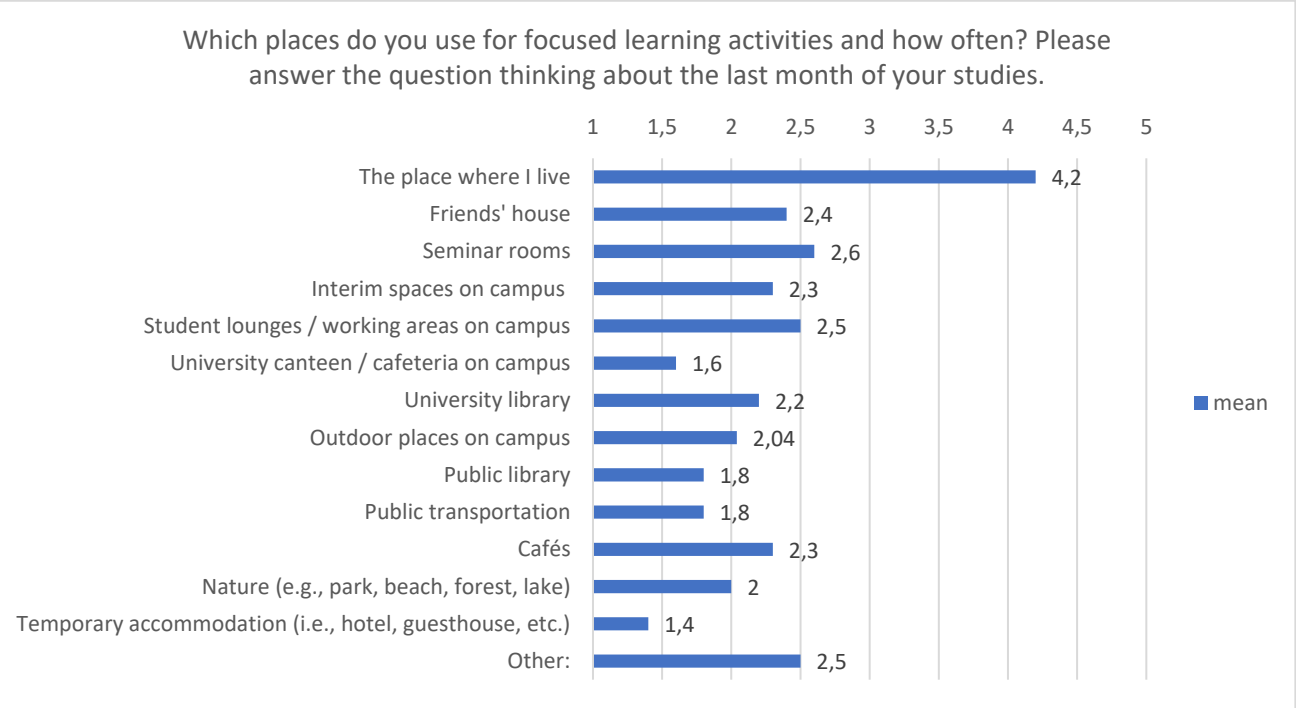

Figure 6: Places used for focused learning activities (n = 152)

The item and scale analyses were performed, and the findings are shown in *Table 2*. The availability and accessibility of focused learning spaces were rated by students. *Table 3* indicates that accessibility (mean = 3,17) is somewhat higher than availability (mean = 3,38) and Satisfaction (mean = 2.97).

Name of Scale	Number of Items	Mean	Distribution	item-total-correlation	Reliability of scale (Cronbach's Alpha)
FL_Availability	3	ok	ok	ok	0,81
FL_Accessibility	4	ok	ok	ok	0,82
FL_Satisfaction	2	ok	ok	ok	0,70

Table 2: Item and scale analysis for focused learning activities

Name of Scale	Mean	SD
FL_Availability	2.90	1.04
FL_Accessibility	3.17	0.91
FL_Satisfaction	2.97	0.95

Table 3: Descriptive statistics of focused learning activities

The greatest obstacle for “Focused Learning” that students indicated (*Figure 7*) was “Limited availability (e.g., too crowded)” **75%)**. Furthermore, descriptive data indicated in *Other* indicated that the learning environment locations were too far away to reach by public transportation or that there were insufficient spaces to study inside certain faculties; this information further reinforced the higher rating. However, the remaining results were relatively evenly distributed with the *University Canteen/Cafeteria, Public Library, Public Transportation, Cafes*, and *Temporary Accommodation* rating the lowest **(mean between 1.4 and 1.8)**.

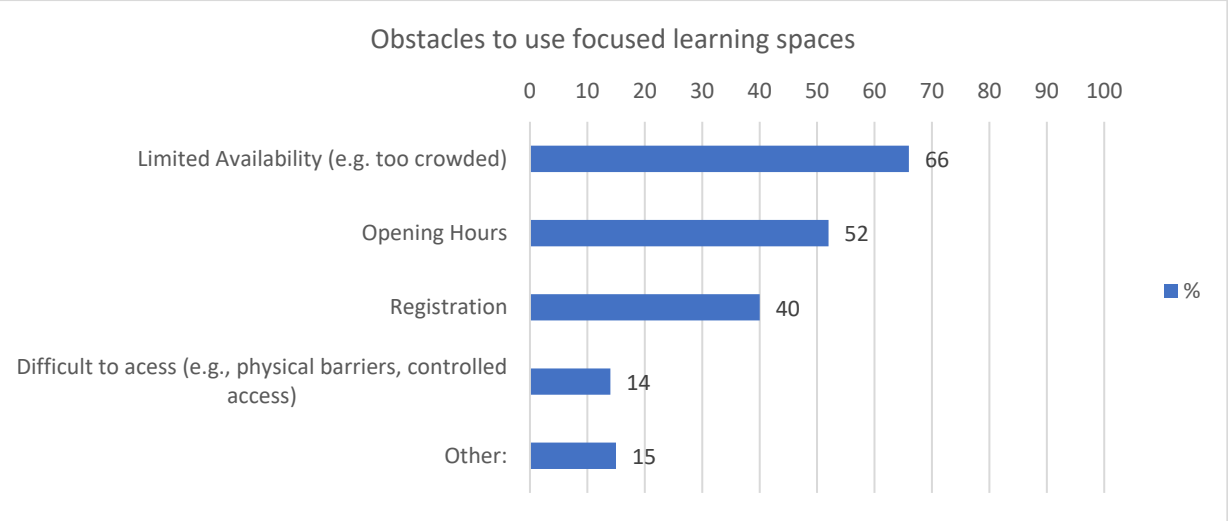

Figure 7. Obstacles to use focused learning activities.

Collaborative learning activities

Regarding collaborative learning activities (Figure 8) students preferred "Places that I live" (e.g., house or apartments) (mean = 3.5), followed by other larger and more group-friendly venues such as "Friends House" (mean = 2.9) and "Seminar Rooms" (mean = 2.8). Similarly, students utilised the "University Cafeteria/Canteen" the least (mean = 1.6), "Public Transportation" the least (mean = 1.4), and "Temporary Accommodation" the least (mean = 1.2). Additional qualitative data in "Other" indicated that students participated in collaborative learning activities using online platforms and resources (e.g., video calling).

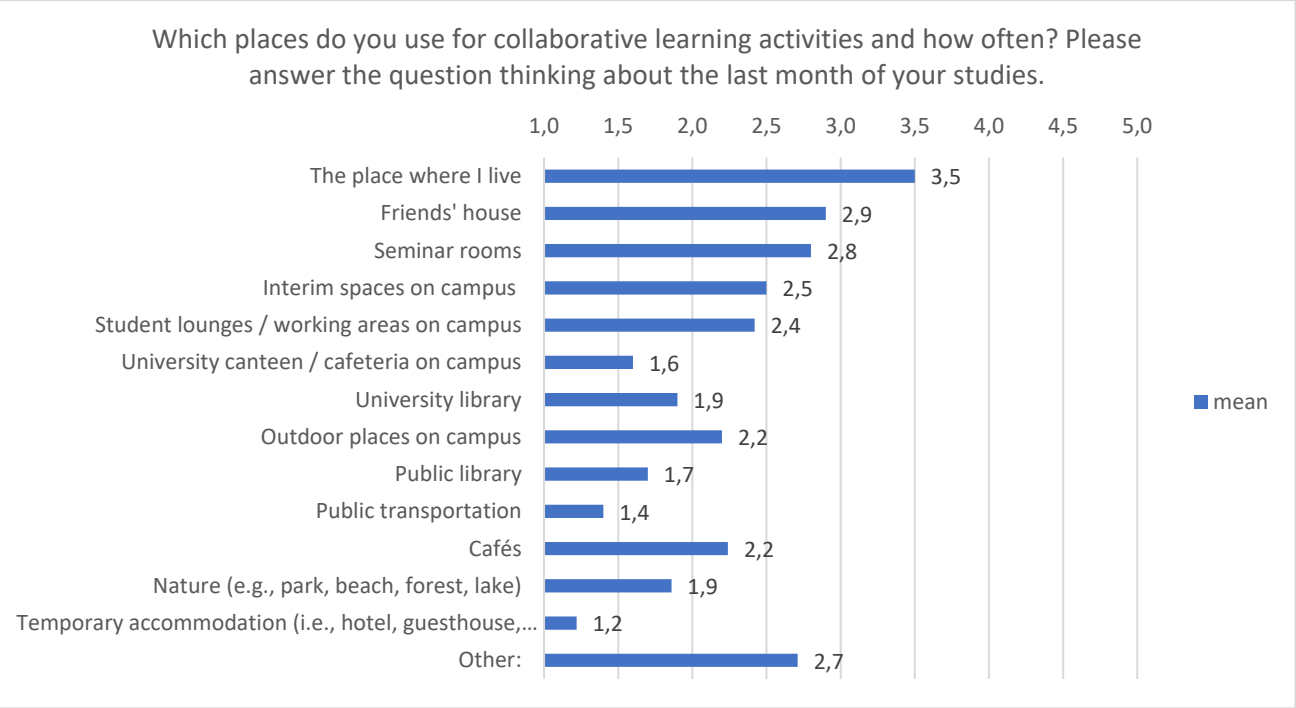

Figure 8: Places used for collaborative learning activities (n =152)

The item and scale analyses were performed, and the findings are shown in Table 4. All items demonstrated internal consistency of the items (with a Cronbach alpha above 0.7) with items removed for Availability. Table 5 shows how students rated the availability and accessibility of collaborative learning spaces with "Accessibility" rating marginally higher.

Name of Scale	Number of Items	Mean	Distribution	item-total-correlation	Reliability of scale (Cronbach's Alpha)
CL_Availability	3	ok	ok	Ok, except CL_AV_2 0,82, alpha without FL_AV_2 0,74	0,86
CL_Accessibility	4	ok	ok	ok	0,83
CL_Satisfaction	2	ok	ok	ok	0,76

Table 4: Item and scale analysis of collaborative learning activities

Name of Scale	Mean	SD
CL_Availability	3.02	1.04
CL_Accessibility	3.06	0.93
CL_Satisfaction	2.93	0.97

Table 5: Descriptive statistics of collaborative learning activities

In terms of the primary obstacles to Collaborative Learning Activities (*Figure 9*), "Limited Availability" (45%), was followed closely by "Opening Hours" (49%) and Registration (36%). Additional qualitative data disclosed in the "Other" choice revealed that students also

commented about a lack of resources (e.g., power points), difficulties with public transportation, and locations that were not good for group study (e.g., could not talk loudly).

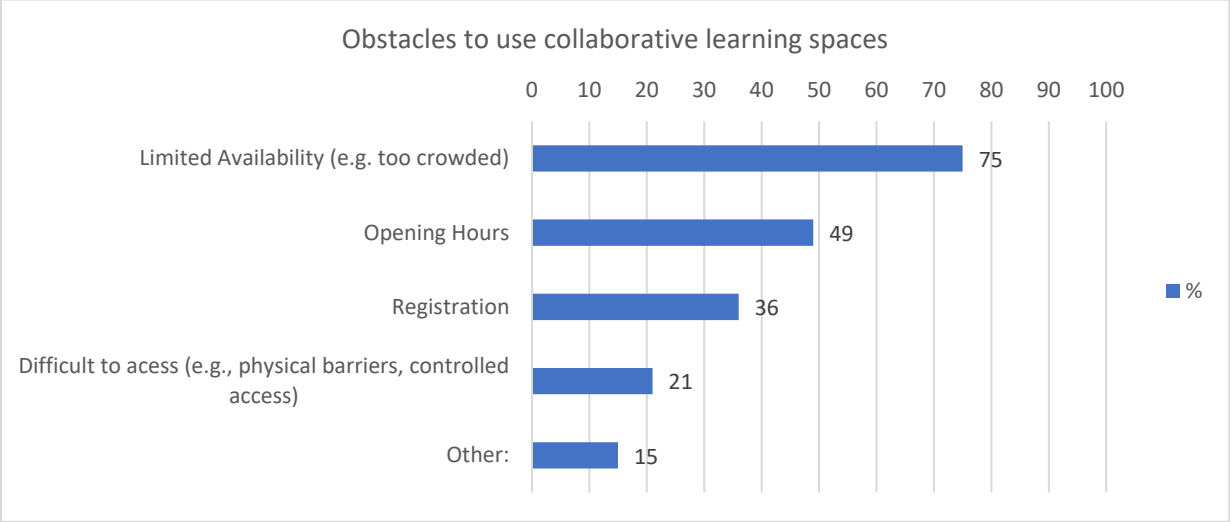

Figure 9. Obstacles to use collaborative learning activities.

Hybrid learning activities

Students were asked about what tools they utilise for their studies. Almost all students (97%) reported owning a laptop/notebook/netbook, with fewer reporting owning a smartphone (74%), or tablet (31%). E-book readers had the lowest rating, with only 6% of students claiming to own one. No students stated that they were utilising other devices.

Approximately 64% of students report having access to WIFI on campus. However, when it comes to feeling satisfied with the WIFI quality on campus, just 4% of students indicated as "Totally Agreeing", with the rest "Disagreeing" (47%) or "Totally Disagreeing" (23%). It should be noted that slightly under half (41%), chose "neither agreeing or disagreeing," which might imply that they do not utilise campus WIFI as frequently as other students or use personal mobile hotspots.

Most students utilise "Messenger Services" (mean = 4.3), "Online document management platforms" (mean = 4.2), and "video communication" (mean = 4.0) in virtual spaces for learning. Students use learning management systems (mean = 3.1) and social media (mean = 3.0) somewhat less. Online forums (mean = 2.1), Online chat (mean = 2.3), and Augmented/virtual reality (mean =1.5) are the least engaging tools.

Main technological barriers were "Lack of infrastructure (e.g., availability of power points)" (63%), “Lack of technical support” (36%), and “Outdated technology” (29%). Considering the low percentages of “Complexity” (7.7%) and “Not confident enough” (6%), it is possible to assume that technological barriers do not exist from an interaction perspective but rather a

systematic one meaning that it is usually the system/lack of resources available to the students rather than the students not knowing how to interact with them.

Dependent variables (satisfaction, belongingness, interpersonal relations, well-being)

Most of the scales had good findings from the item and scale analyses shown in Table 6. Only the two items (S_IR_2 and B_U_2) were required to be removed.

Table 7 shows the mean and standard deviations of scales.

Name of Scale	Number of Items	Mean	Distribution	item-total-correlation	Reliability of scale (Cronbach's Alpha)
Satisfaction	6	ok	ok	ok	0,89
Belongingness	6	ok	ok	Ok, except B_U_2 0,25, alpha without B_U_2 0,87	0,84
Satisfaction	6	ok	Ok, except S_IR_2	ok	0,89
Well-Being	5	ok	ok	ok	0,87

Table 6: Item and scale analysis of central dependent variables

Name of Scale	Mean	SD
Satisfaction	3.26	0.85
Belongingness	3.10	0.88
Interpersonal Relationships	3.90	0.79
Well-Being	46.62	20.03

Table 7: Descriptive statistics of central dependent variables

Conclusion descriptive results

The results from Sapienza Rome sample are predominantly representative of the student community in terms of gender, age, and subject of study. Most of the surveyed students are full-time students pursuing a master's degree and studying full-time. Other notable challenges we observed included language barriers, the need to work while studying, and economic obstacles. Considering the issue of (particularly international or non-local) students needing accommodation close to the campus locations and the cost of living, this is likely responsible for In addition, while only 9% of students indicated having mental diseases, the main response to other comments was about experiencing just that, with many students identifying as having anxiety and stress related to various aspects of their study (e.g., too many exams or being

overloaded). Lastly, while students indicated that they spend most of their time at home for focused or collaborative learning, it was not surprising given the population density of Rome and the lack of adequate on-campus locations to study either individually or even less as a group.

Hypotheses testing

The hypotheses testing describes the impact of the used informal or non-conventional learning spaces on students' belongingness, interpersonal relationships, well-being and university campus satisfaction.

Hypotheses 1a, 1b, 1c and 1d

Hypothesis 1a: The higher the availability and accessibility of informal learning spaces on campus, the higher the university belongingness.
Hypothesis 1b: The higher the availability and accessibility of informal learning spaces on campus, the higher the interpersonal relationships.
Hypothesis 1c: The higher the availability and accessibility of informal learning spaces on campus, the higher the well-being of students.
Hypothesis 1d: The higher the availability and accessibility of informal learning spaces on campus, the higher the university campus satisfaction.

	Belongingness	Interpersonal Relationships	Well-Being	University Campus Satisfaction
Availability	r = 0.34 p 0.000	r = 0.92 p 0.262	r = 0.21 p 0.110	r = 0.56 p 0.000
Accessibility	r = 0.32 p 0.000	r = 0.11 p 0. 176	r = 0.13 p 0.110	r = 0.52 p 0.000

Table 8: Results of hypotheses 1a, 1b and 1c

All requirements are fulfilled.

Hypotheses 1a and 1d are supported, 1b and 1c are not supported.

Regarding hypothesis 1, the results demonstrate that there is a positive association between the availability and accessibility of "belongingness" and "university of campus satisfaction." The findings, however, show that there is a less (statistically) significant association between the availability and accessibility of "well-being" and "interpersonal relationships."

The findings might imply that increasing campus informal learning areas is a factor that could lead to more favourable outcomes for students. As a result, when it comes to a student's sense of belonging and pleasure on campus, enhancing the availability and accessibility of informal

learning areas on campus is important. Additionally, it is likely that there are other factors that influence a student's interpersonal relationships and well-being.

Hypothesis 2

Hypothesis 2: The availability, accessibility and satisfaction with informal focused learning spaces is higher than of informal collaborative learning spaces.

	Mean	SD	n	T-Test	Effect size Cohen´s d
Availability_FL	2.89	1.04	152	t(151) = -1.81, n.s	0.11
Availability_CL	3.01	1.04	152		
Accessibility_FL	3.16	0.90	152	t(151) = 1.99, p = <0.05	0.10
Accessibility_CL	3.06	0.93	152		
Satisfaction_FL	3.00	0.96	152	t(147) = 0.71, n.s	0.04
Satisfaction_CL	2.93	0.97	152		

Table 9: Results of hypothesis 2

All requirements are fulfilled.

All the findings demonstrated little to no difference between focused learning spaces and collaborative learning spaces. Thus, if availability, accessibility, and satisfaction have minimal influence on these places, other factors are likely to have a greater impact on the satisfaction levels of these spaces.

Hypotheses 3a, 3b, 3c and 3d

Hypothesis 3a, 3b and 3c: Informal collaborative learning spaces are more relevant to enhance university belongingness, interpersonal relationships, well-being and university campus satisfaction than informal focused learning spaces. (There is a stronger relationship between informal collaborative learning spaces and university belongingness, interpersonal relationships, well-being and university campus satisfaction than between informal focused learning spaces and university belongingness, interpersonal relationships, well-being and university campus satisfaction.)

	Belongingness	Interpersonal Relationships	Well-Being	University Campus Satisfaction
Availability_FL	r = 2.13 p 0.009	r = 0.95 p 0.245	r = 0.24 p 0.003	r = 0.53 p 0.000

Availability_CL	r = 2.13 p 0.004	r = 0.55 p 0.501	r = 0.12 p 0.004	r = 0.23 p 0.000
Accessibility_FL	r = 0.25 p 0.001	r = 0.14 p 0.092	r = 0.12 p 0.151	r =0.50 p 0.000
Accessibility_CL	r = 0.28 p 0.001	r = 0.06 p 0.456	r = 0.12 p 0.128	r = 0.48 p 0.000

Table 10: Results of hypotheses 3a, 3b and 3c

All requirements are fulfilled.

Table 10 presents a mix of meaningful results for Hypothesis 3. "Accessibility" and "Availability" (both focused and collaborative learning environments) had significant impacts on "belongingness" and "university campus satisfaction." However, only "availability" in both focused and collaborative learning had significant effects on "well-being". The remaining results were not significant.

Discussion hypotheses testing

Hypotheses 1a and 1d are supported, demonstrating positive results when some characteristics of informal learning space availability and accessibility are improved. However, more information is needed to determine whether there are issues within these areas that need to be addressed or whether other factors (other than the availability and accessibility of informal learning spaces) are impacting the results of interpersonal relationships and well-being, and consequently need to be addressed.

Hypotheses 2 is not supported given that the results had little or no impact.

Hypotheses 3a to 3d are not supported. It can be assumed that informal learning spaces should allow flexible usage thereby increasing the amount of time students spent with learning activities on campus.

Conclusion quantitative data analysis

The results indicate that informal learning areas play a vital role in improving feelings of belonging, social connections, overall happiness, and satisfaction with university campus life. The link between the presence and ease of access to informal learning spaces is not only noticeable in significant factors like belongingness to campus and happiness with campus but also in more general aspects like interpersonal relationships and well-being. It is reasonable to expect that enhancing the quality of on-campus educational environments will stimulate better integration and stronger connections among students, resulting in higher levels of pleasure and well-being.

Many students are dissatisfied with the existing operating hours and accessibility to various places, claiming that they are limited or inaccessible. This feeling echo general concern among

students, who frequently face difficulties while attempting to use facilities outside of regular operation hours (e.g., outside of class hours) or confront physical hurdles that restrict them from entering particular locations (i.e., locked classrooms). Restricted opening hours and inaccessible places limit students' capacity to participate in academic and extracurricular activities, hurting their entire educational experience. As a result, there is an increasing desire for a general overhaul aimed at examining existing policies and addressing these issues, ensuring that students have greater flexibility and equitable access to available resources.

Further investigation is needed to investigate these complicated links in greater depth.

Focus groups/interviews: deductive themes

Figure 18 displays the frame of the focus group interview guide, and simultaneously, the **four deductive themes** for both focus groups (students and lecturers):

1.	Impact of the used informal or non-conventional learning spaces on students' knowledge acquisition and satisfaction with support and the learning environment.
2.	Existing inequalities and barriers related to informal or non-conventional learning spaces, including access to tangible and intangible technical equipment (i.e., sockets, WIFI) as well as to physical-spatial environments conducive to learning and well-being.
3.	Students' and lecturers' awareness and enabling strategies to deal with existing inequalities and barriers.
4.	Hybrid and virtual learning activities.

Table 11: Deductive themes of the focus group interviews (for students and lecturers)

An English version of the interview guide was developed by HTW Berlin as the lead partner of PR2. The interview guide was revised two times following the suggestions and comments of the project partners in a participatory process. Final guidelines, including interview questions and some instructions concerning the interview process, were translated into the respective languages (see Appendix). It was aimed to conduct at least one focus group interview with students (5-7 students, incl. 3 with SWFO) and at least one with lecturers (5-7 lecturers) from each university in each country. Data was transcribed, coded and analysed according to guidelines developed by HTW Berlin in cooperation with the partners (see Appendix).

Student focus groups/interviews

Implementation

The focus group with students was conducted with five students enrolled either as (full-time) domestic or part of the ERASMUS program and thus completing part of their degree abroad, thereof three students with fewer opportunities, on the 26th of June 2022 (12 p.m. – 01.30 p.m.) online via Google Meet. The students interviewed predominantly studied within the

Faculty of Design and Communication and Multimedia (Architecture) and pursued primarily a bachelor's degree with one student pursuing a master's degree, as shown in Table 12.

Students	Campus	Faculty	Degree
Student 1 (S1)	Gramsci/ Valle Giulia	DCVM	Bachelor
Student 2 (S2)	Flaminia	DCVM	Bachelor
Student 3 (S3)	Flaminia	DCVM	Bachelor
Student 4 (S4)	Gramsci/ Valle Giulia	DCVM	Bachelor
Student 5 (S5)	Gianturco	DCVM	Bachelor
Student 6 (S6)	Piazza Borghese (Fontanella Borghese)	DCVM	Master

Table 12: Overview of the focus group participants – students (based on focus groups with students, 2022).

Results

Figures 11–14 depict the use of informal learning spaces (ILS) at various Sapienza locations. The highlighted areas are those that students reported as being utilised as ILS the most. The orange dots represent areas utilised for general informal learning, whereas the green dots represent locations used for specialist informal learning. The blue dots, on the other hand, represent the sites where collaborative informal learning activities take place. Looking at the different dot allocations, students' knowledge and use of ILS were stronger in the Gramsci and Flaminia sites, which are where the majority of students take lessons.

Examining the distribution of the dots across the different sites reveals that students at the Gramsci and Flaminia locations had a greater indication/knowledge of ILS. Most students attend their courses at these places, implying a link between students' familiarity with the venues and their proclivity to use the accessible informal learning spaces.

1. Impact of the used informal or non-conventional learning spaces on students' knowledge acquisition and satisfaction with support and the learning environment

1.1. Places Used for Informal Learning

In terms of the influence of informal or non-traditional learning spaces on students' knowledge acquisition and satisfaction with assistance and the learning environment, it is worth noting that students commonly use lesson rooms as study locations. Outside of planned sessions, these areas were used if they were accessible and free of access restrictions (e.g., unlocked). Students discovered practical options to engage in informal learning by reusing these spaces. This practice not only aided in their information acquisition, but it also influenced their satisfaction with the help they got and the overall learning environment.

1.2. Frequency of use in the last four weeks (favourite or most important place to learn?)

As mentioned, students do not often use locations on campus as they do not afford them an adequate location to study. However, most students indicated using spare rooms or the Zen room as places to connect with students.

1.3. Satisfaction with the most important/most frequently used learning location (strengths/weaknesses)

Students frequently use the rooms or places outside of classrooms where they learn. The main advantage of these venues is that they are at or near the locations where students take classes, making them convenient. One of the biggest disadvantages of these places is their accessibility, which varies by location, with some rooms being locked after lectures, preventing students from using them.

Figure 11: Floorplan of Gianturco Building (the floor plan on the right is indicative of levels 2 – 5)

Figure 12: Floorplan for Flaminia Building

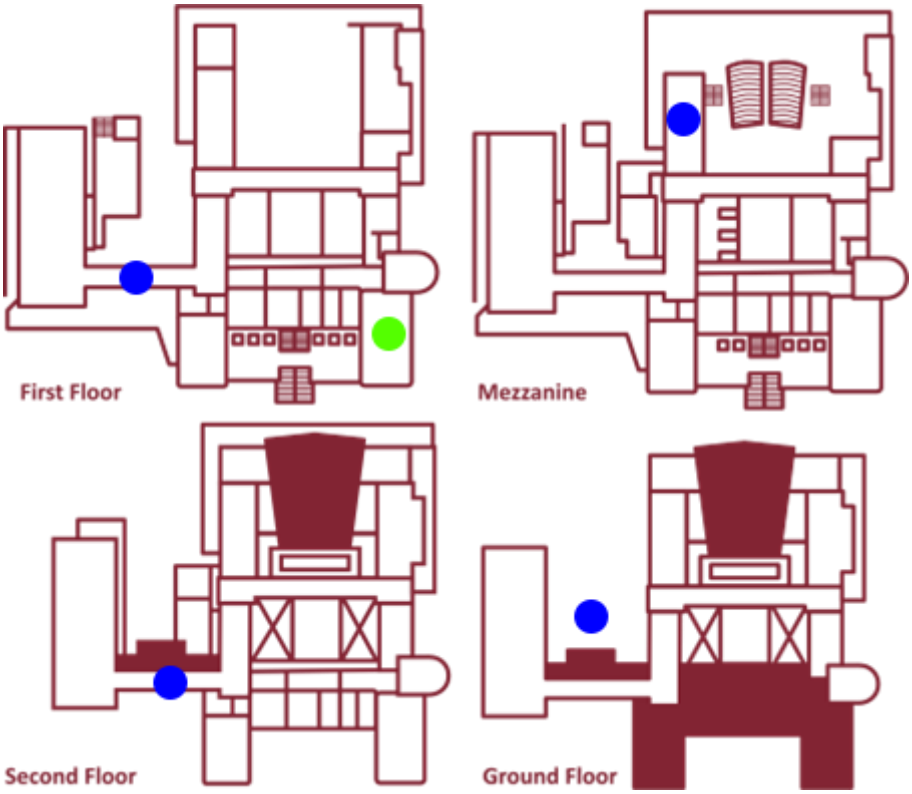

Figure 13: Floor plan of Gramsci/Valle Giulia Building

Figure 14: Floorplan of Orizzontale

Co-funded by
the European Union

Campus/ Building	Label	Notes / Description	Indoor	Outdoor	Focused learning	Collaborative Learning	Reference
Gianturco	GIAN		x		x	x	S2, S5
Flaminia	FLAM		x		x	x	S2, S3
Piazza Borghese (Fontanella Borghese)	BORG		x		x	x	S6
Gramsci/ Valle Giulia	GRAM		x		x	x	S1, S4
Gramsci/Valle Giulia "Orizontale/Zen"	Gramsci/ Valle Giulia "Orizontale/ Zen"	Area at Gramsci where students can relax[1]		x		x	S4

Table 13: Important informal learning spaces at four INLS as identified by six students.

2. Existing inequalities and barriers related to informal or non-conventional learning spaces, including access to technical equipment, internet and physical-spatial environments conducive to learning and well-being.

Most of the ILS that the students interviewed used for their classes while at university were relatively satisfied; however, all the students stated that it was more convenient to study at home or at a location other than the university (e.g., a friend's house) because it was just easier and more convenient. As a result, students stated that many of the challenges associated with the availability and accessibility of ILS were likely to impact where they studied alone or with others.

2.1. Availability of informal learning spaces

Most students expressed satisfaction in finding suitable study areas when needed. However, some students mentioned that implementing a booking system could further enhance their experience by minimising disruptions. Nonetheless, one student (S5) specifically highlighted the lack of designated study areas at Gianturco, where empty classrooms between lectures were the only available spaces, rendering it unsuitable for spending an entire day on campus. Consequently, students tended to leave after their classes. A similar sentiment was echoed by another student (S6) at the Piazza Borghese campus, who also noted the absence of sufficient communal spaces beyond classrooms or areas near the entrance, despite the overall pleasant atmosphere of the campus. These observations highlighted the importance of providing dedicated and accessible informal learning spaces to meet the diverse needs of students.

[1] https://www.orizzontale.org/en/portfolio_page/cento

2.1.1. Technological infrastructure (availability of plugs, WIFI, etc.).

Many students lamented the absence of well-functioning WIFI; this was a common complaint among students in many settings. Negative comments were also made regarding the availability of power points. In some instances, students (S3) preferring to take printed copies of notes rather than worrying about having access to power.

2.1.2. Environmental factors (i.e., occupancy, noise-level, etc.)

A recurring complaint among students centred around the temperature within the rooms. Many students expressed that during winter, certain rooms, like the Zen Room, lacked heating, resulting in uncomfortably cold conditions. Conversely, during summer, rooms such as Gramsci/Valle Giulia were noted to be excessively warm. However, apart from temperature-related concerns, other environmental elements, including noise levels and overcrowding, did not appear to be significant issues for students. The primary focus remained on addressing the temperature imbalances to ensure a comfortable and conducive learning environment.

2.1.3. Ambience (conditions promoting well-being)

Students agreed that there were no negative aspects impacting their overall feeling of well-being when using these places. One complaint raised was a lack of suitable study spaces, which had a slight influence on their experience. Despite this constraint, the (available) IFLS's overall atmosphere contributed to their well-being by providing them with a space to temporarily work between or after classes.

2.2. Access to informal learning spaces

2.2.1. Restricted opening hours

Overall, students did not provide any specific comments regarding the operational hours of the locations or the impact of other accessibility factors on their utilisation of the space. This lack of discussion can be attributed to the fact that students generally do not require access to these spaces beyond the provided hours. As a result, their focus shifted away from the availability and accessibility concerns associated with extended hours, reflecting a reliance on the existing opening schedules that catered adequately to their needs.

2.2.2. Restricted access to information

Regarding the issue of restricted access to information, it was notable that the concern revolved around a general lack of information rather than a specific absence of access. Most updates regarding building changes, opening times, and overall events were primarily communicated through email channels. Subsequently, these updates were informally reiterated by lecturers either during class sessions or through the digital platforms they utilized, such as Google Classroom. While the flow of information existed, the reliance on informal means of dissemination and the absence of centralized platforms hindered comprehensive and efficient access to crucial updates and announcements.

2.2.3. Students with fewer opportunities

Students with fewer opportunities include those who need to work to maintain their independence and the expense of living in another country (ERASMUS students). Consequently, comments on the balance between the two suggested that it was difficult due to last-minute shift changes (S1), which frequently led in the student working on the weekend and therefore taking time away from focusing on their studies. Other domestic students (i.e., students from other regions in Italy) expressed concerns about having to relocate to Rome to study and the expenditures connected with that (despite receiving a scholarship) (S2). While they attempted to be more present, their living location puts a burden on their general well-being, with every day public transit taking its toll.

2.3. (Potential) additional barriers for SWFO

One major challenge for ERASMUS students was language because, outside of tourist regions, the level of English is low, making communication difficult.

3. Students' perception on awareness and enabling strategies to deal with existing inequalities and barriers

3.1. Lecturers and/or university administrations' awareness and plans to reduce barriers

Most students did not encounter any significant barriers when it came to accessing informal learning spaces. However, a common complaint was the unreliable or weak Wi-Fi, (particularly in places like the Zen Classroom). Furthermore, students reported that heating was insufficient during winter, which was an issue across all locations. Additionally, there was a shortage of electrical outlets, making it challenging to find a place to plug in devices. Students felt that these issues were unlikely to be addressed, as some professors were unaware of them. Nevertheless, when students faced difficulties related to language and culture, lecturers were supportive in resolving these issues and helping them integrate with Italian students. One student (S5) acknowledged that some personal difficulties were beyond the university's control and did not discuss them with lecturers.

3.2. Students' ideas and potential plans to break these barriers.

The students did not suggest any solutions to overcome these obstacles because they believed that the problems were primarily structural and required dedicated spaces to be built or created. It is disappointing that, despite finding the learning spaces conducive to studying, the students felt that there was not enough space for informal learning, leading them to seek out alternative locations off-campus.

4. Hybrid and virtual learning activities

4.1. Knowledge/support to find informal learning spaces on campus

Students acknowledged a lack of understanding in this area, emphasising the need for information and assistance in locating informal learning venues on campus. They indicated that neither lecturers nor other resources, such as online platforms or noticeboards, informed them about the existence and location of such venues. As a result, when it came to accessing and utilising informal learning locations on campus, students felt misinformed and unguided, emphasising the need to improve communication channels and offering tools to aid their discovery.

4.2. Enhancing interactions within the physical space

Students' main interest was improving relationships within the physical area. Their attention was directed primarily to two important issues: the lack of dependable Wi-Fi access and the inadequacy of current places for long-term or informal learning. Students emphasised the critical need for enhanced connection to promote seamless involvement within the physical world. Furthermore, they emphasised the need for a larger number of acceptable locations accessible to serve their different learning demands, establishing an environment favourable to prolonged or informal learning experiences.

4.2.1. *Overcoming barriers in collaborative hybrid groupwork by integrating services into the virtual space*

Overcoming barriers to collaborative hybrid groupwork by integrating services into the virtual space emerged as a key focus. The implementation of hybrid and virtual learning activities yielded significant benefits for working students, granting them equal opportunities to engage in lessons and revision sessions they might have otherwise missed due to unpredictable work schedules. By eliminating the need for commuting between class and work, online and hybrid learning proved invaluable. However, students expressed their belief that in-person lectures and conversations are essential for effective learning and collaboration, highlighting their preference for face-to-face collaboration and communication, particularly in the context of laboratory work.

Lecturer focus groups/interviews

Implementation

The focus group with lectures was conducted with seven lectures on the 6th of May 2022 (09:30 a.m. – 11.30 a.m.) as shown in Table 14. The focus group was conducted on Google Meet.

Lecturers	Campus	Faculty	Position
Lecturer 1 (L1)	Sapienza University of Rome – Architecture Faculty	Department of History, Design and Restoration of Architecture	Associate professor
Lecturer 2 (L2)	Sapienza University of Rome – Architecture Faculty	Department of History, Design and Restoration of Architecture	Young researcher/lecturer
Lecturer 3 (L3)	Sapienza University of Rome – Architecture Faculty	Department of History, Drawing and Restoration of Architecture (DSDRA).	Post-doc research fellow
Lecturer 4 (L4)	Sapienza University of Rome – Architecture Faculty	Department of History, Design and Restoration of Architecture	Researcher
Lecturer 5 (L5)	Sapienza University of Rome – Architecture Faculty	Department of History, Design and Restoration of Architecture	Associate faculty member

Lecturer 6 (L6)	Sapienza University of Rome – Architecture Faculty	Department of History, Design and Restoration of Architecture	Researcher
Lecturer 7 (L7)	Sapienza University of Rome – Architecture Faculty	Department of History, Design and Restoration of Architecture	Associate lecturer
Lecturer 8 (L8)	Sapienza University of Rome – Architecture Faculty	Department of History, Design and Restoration of Architecture	Associate professor

Table 14: Overview of focus group participants - lecturers

Results

Throughout their lessons, the students who participated in the interviews expressed satisfaction with most of the informal learning spaces, despite their lack of specific categorisation, because they gave proper chances for academic study. However, it came as no surprise that most students preferred to study in the quiet of their own homes or in alternate off-campus locations, such as a friend's home. As a result, issues concerning the availability and accessibility of informal learning spaces significantly influenced the choice of study settings, whether solitary or collaborative, resulting in a decrease in on-campus presence and a preference for spaces that provided enhanced convenience and accommodation.

Campus/ Building	Label	Notes / Description	Indoor	Outdoor	Focused learning	Collaborative Learning	Reference
Library	BIB		X		X		L3
Aula Zen (room)	AUL_Z	Classroom equipped with plugs, but few stations	X			X	L1, L2
Aula Zen (hallway)	AUL_Z_Cor	Very cold classroom in winter (without heating)	X		X	X	L1, L2
Picnic Tables	PIC	(Wooden tables near the pond)		X	X		L2
Gianturco	GIAN		x		x	x	L5
Flaminia	FLAM		x		x	x	L5
Piazza Borghese	BORG		x		x	x	L3

(Fontanella Borghese)							
Gramsci/ Valle Giulia	GRAM		x		x	x	L1

Table 15: Important informal learning spaces at Faculty of Architecture locations over Sapienza as identified by lecturers.

1. **Impact of the used informal or non-conventional learning spaces on students' knowledge acquisition and satisfaction with support and the learning environment**

1.1. Places Students Use for Informal Learning

The focus was on the locations that students chose for informal learning, emphasising the influence of informal or non-conventional learning spaces on students' knowledge acquisition and satisfaction with assistance and the learning environment. Lecturers emphasised that students actively sought out alternate learning and collaboration situations that extended beyond the constraints of typical course locations, which also included using internet platforms and venturing off-campus – that is mostly at home. These learning environments had a substantial impact on students' learning experiences. They were important in increasing information acquisition and adding to students' overall happiness with the assistance they got and the learning environment they encountered.

Insert map of the campus with mapping of the important informal learning places

1.2. Put photos of preferred learning spaces on campus in the appendix

2. **Existing inequalities and barriers related to informal or non-conventional learning spaces, including access to technical equipment, internet, and physical-spatial environments conducive to learning and well-being.**

2.1. Availability of informal learning spaces

It is important to analyse the availability of such places to shed light on current disparities and impediments connected to informal or non-conventional learning environments. A lecturer (L1) underlined the importance of distinguishing between university-provided study rooms and venues, such as Valle Giulia and Gramsci, that students have resorted to utilising for studying despite not being initially designed for that purpose. These areas may be undesirable owing to variables such as physical layout, inadequate resources, or planned usage. The underlying problem is a lack of organisation among students as well as a lack of knowledge of their requirements by the administration.

Furthermore, another lecturer (L2) highlighted those spaces in other locations, like Fontanella Borghese, are underutilised due to limited access in terms of daily hours or practical issues, such as noise restrictions in spaces like the library, which do not align well with the collaborative nature of group work. This restricts students' ability to utilise these spaces effectively.

According to L5, students found Via Flaminia and Gianturco locations unsuitable for studying, despite attempting to use them for that purpose. Even prior to the epidemic, students resorted to any available space for extracurricular activities, often hesitating to attend classes. They would frequently gather in the outdoor areas of nearby cafes for group work, combining it with eating, drinking, or smoking, particularly in warm weather.

Additionally, L3 observed that students would often occupy classrooms, even if they were not related to the class being taught, as there was a scarcity of dedicated spaces outside of the

classroom for their study needs. This highlights the lack of available space for students beyond the confines of their regular classes.

Lastly, L3 shared their personal experience as a former doctoral student, noting the necessity of utilising spaces not specifically designated for teaching. They and their classmates resorted to using available spaces, such as frontal teaching rooms or any other accessible areas, to carry out their study and research activities. Additionally, they frequently utilised the spaces of LIRALabs and the Laboratory at Castro Laurenziano.

These observations collectively highlight the existing inequalities and barriers to accessing informal learning spaces, including limitations in technical equipment, internet access, and physical-spatial environments that promote learning and well-being. Addressing these challenges requires a comprehensive approach to ensure equitable access and create inclusive learning environments for all students.

2.1.1. Technological infrastructure (availability of plugs, WIFI, etc.)

Lecturers also echoed the same concerns as the students regarding the lack of availability of dedicated learning spaces. In addition, lecturers (L2) also discussed other study spaces such as the Zen classroom, library, reference space, Petruccioli classroom (though, in their opinion, dangerous due to high turnout and inadequate electrical system), and the main atrium, which has uncomfortable stone seats and limited outlets.

2.1.2. Environmental factors (i.e., occupancy, noise-level, etc.)

Lecturers (L2) commented on the Zen area and its outdoor "puddle" area, mentioning that even though the area is surrounded by greenery that promotes concentration, it has limited accessibility due to rain or excessive sunlight during different seasons. Additionally, there are no computer sockets available, and while it is not a dedicated study area, students use it for studying as indoor spaces are insufficient. It is more commonly used by individuals rather than groups.

2.1.3. Ambience (conditions promoting well-being)

Lecturers did not comment much in terms of how the spaces offered well-being for the students beyond suggesting that the greenery in open areas assisted the students to concentrate while out in the space.

2.2. Access of informal learning places (opening hours, registration /controlled access, physical barriers)

2.2.1. Restricted opening hours

Regarding the access of informal learning places, specifically restricted opening hours, the lecturers briefly acknowledged the adequacy of the existing timeframes. However, they emphasised that this aspect did not pose a significant concern due to the students' limited duration of stay in these spaces.

2.2.2. Restricted access to information

When considering the access of informal learning places, particularly the aspect of restricted access to information, it was observed that the main concern revolved around a general dearth of information regarding suitable study locations beyond scheduled lessons. It is important to note that this issue seems to primarily stem from the limited availability of dedicated spaces where students can engage in self-directed study. Consequently, the perceived restriction of access to information is largely attributed to a broader lack of knowledge regarding viable options for independent study.

2.2.3. Students with fewer opportunities (SWFO)

The significance of hybrid and virtual learning for Students with fewer opportunities (SWFO) was a key point of emphasis among lecturers. They highlighted how these approaches enabled SWFO students, who face limited opportunities to attend in-person sessions, to actively participate in the lessons and engage with them. This sentiment was strongly echoed by the students themselves, who expressed gratitude for the chance to engage in classes online, as it provided them with the flexibility to manage other commitments, such as work shifts.

2.3. (Potential) additional barriers for SWFO

Potential barriers that SWFO have are largely based on economic or location restrictions meaning that they either must work to sustain themselves (e.g., to pay rent, travel long distances, or have difficult accessing the university via public transportation).

3. Lecturers' perception on awareness and enabling strategies to deal with existing inequalities and barriers

3.1. Lecturers and/or university administrations' awareness and plans to reduce barriers

While the lecturers (all) commented that for the most part, while they prefer to have in presence interactions with student, they have acknowledged that, mainly due to covid, hybrid interactions are how they have had to adapt to also accommodate students for various reasons (e.g., costs, transportation times, etc). L1 also commented that "I have to adapt to the changes. Adapting to change is correct, but without forgetting that teaching is primarily "relationship" suggesting that this is an inevitable part of future teach and student interactions".

3.2. Lecturers' potential plans to break these barriers

Lecturers did not appear to have the intention to break these barriers, opting to instead to work within them.

4. Hybrid and virtual learning activities

4.1. Opinions on overcoming barriers by integrating services in the virtual space (apps, etc.)

With many classes now operating in hybrid modes, lecturers have recognized the necessity to modify their teaching practices. However, with more students choosing to attend virtually, the traditional lesson structure has been challenged. Although measures have been implemented to encourage or even require students to attend in-person lessons (e.g., removing the option for virtual participation), students still prefer to have the option of virtual participation to address attendance-related concerns. Consequently, the prevailing view is to adapt and discover ways to accommodate this shift in pedagogy.

4.2. Opinions on how an online platform could enhance interactions within a physical space

Opinions abound on how an online platform has the potential to greatly enhance interactions within a physical space. It was mostly perceived that such a platform could significantly broaden students' knowledge of various areas where they could study or engage with fellow students. However, discussions among all participants regarding the feasibility of incorporating numerous stable spaces into the platform the main concern revolved around ensuring the consistent and regular availability of these spaces, making them reliable for utilisation as immersive and conducive learning environments.

4.3. Overcoming barriers in collaborative hybrid groupwork by integrating services into the virtual space

According to feedback from lecturers, they have recognised the need for a change in their teaching methods and interaction with students. They have already implemented tools such as video conferencing (e.g., Zoom or Google Meet), document sharing, and task assignment through email or platforms like Google Classroom to assist students. Moreover, virtual meetings are also being offered to support students who, for example, may face transportation or other challenges. Thanks to the pandemic, integrating services into the virtual space has become an important part of the daily practices of lecturers to help students overcome barriers in collaborative hybrid group work and create a more seamless and effective and efficient learning experience.

Conclusion qualitative data analysis

1. **Impact of the used informal learning spaces on students' knowledge acquisition and satisfaction with support and the learning environment.**

In general, informal learning spaces across various locations are experiencing low usage and engagement due to several recurring factors. The main factor is that the students work from home when they are not in class, therefore reducing the need for informal learning spaces. Another factor is the shortage of available spaces for students to use, and those available (e.g., libraries) may not accommodate the type of work students need to do (such as group work). Additionally, there is a lack of dedicated spaces that students can actively reserve or use on a regular basis, which provide suitable informal learning environments. Therefore, there was little impact on the knowledge acquisition and satisfaction resulting from the informal learning spaces.

2. **Existing inequalities and barriers related to informal learning spaces, including access to tangible and intangible technical equipment (i.e., sockets, WIFI) as well as to physical-spatial environments conducive to learning and well-being.**

It is important to acknowledge that the existing inequalities and barriers related to informal learning spaces can pose significant challenges for students. There is a lack of availability in these spaces, which has impacted students seemingly to the point where they do not consider the university as a place to engage with beyond their lessons, particularly for students who rely on these spaces to study and collaborate. Improving this would be achieved by identifying

the specific challenges faced by students and implementing solutions such as providing more technical equipment and creating physical-spatial environments that are conducive to learning and well-being—spaces that can accommodate students and take into consideration the rationale behind the need for them (e.g., to make effective use of travelling to the university for SWFO). Additionally, it is crucial to actively involve and listen to students' feedback and suggestions to ensure that the learning spaces are meeting their needs, something that feedback has indicated is lacking.

3. **Students' and lecturers' awareness and enabling strategies to deal with existing inequalities and barriers.**

Both students and lecturers are conscious of the challenges posed by existing inequalities and barriers. However, there is a prevailing sentiment that addressing these issues falls primarily within the realm of university administration rather than being an individual responsibility of students or lecturers. It is believed that significant efforts at the university level are needed to develop a comprehensive, long-term strategy that can effectively support students, like what other universities have done by establishing dedicated areas for inclusive and flexible learning (e.g., IFLS areas). Implementing such strategies and initiatives would require a substantial amount of time and coordinated efforts to create an environment that facilitates equitable opportunities for all students.

4. **Hybrid and virtual learning activities.**

The participants in the discussion explored the characteristics necessary for physical learning spaces to meet the demands of today's society, which has experienced significant transformations. Students now have shorter attention spans, utilise diverse study methods beyond traditional books, and engage in online platforms for sharing thoughts, opinions, and files. The traditional notion of the classroom as the sole hub for instruction is being challenged, urging the integration of all spaces within and outside the university as potential avenues for learning.

In particular, the pandemic has prompted the acceptance of virtual and hybrid learning activities, allowing for classes and other forms of interaction such as student-lecturer meetings and group work. Both students and lecturers have recognised that the use of virtual learning activities has altered students' perceptions of class interactions. This has resulted in students opting for online engagement to minimise travel costs in terms of time and money. While many lecturers still prefer and maintain their previous methods of in-person teaching and meetings, they acknowledge the shift in students' preferences for interacting with course content and engaging in additional study. The desire for remote interaction and collaboration is further motivated by the lack of adequate facilities to support informal learning.

Summary: Key findings regarding user's perspective

The feedback overall suggested that a good learning environment should emphasise relational features, such as facilitating student participation and developing their learning. Integration of digital technology, such as room reservation systems, automation, interactive whiteboards, and centralised printing spaces, is critical for optimal utilisation. Comfort, air quality,

temperature, noise, and light may all have an influence on productivity and creativity and play a larger part during lessons than in spaces used outside of those times. Furthermore, spaces should support concentration, but also largely collaborative work given the nature of the work students are required to complete and that different study demands necessitate different qualities to promote cooperation, socialisation, focus, and contemplation.

The study's results suggest that ILS plays a crucial role in fostering belonging, interpersonal connections, well-being, and campus contentment. However, the current provision of informal learning spaces (ILS), including technical infrastructure and ambience, is significantly lacking in the Sapienza Faculty of Architecture locations. To realise the qualitative benefits, there needs to be more effort put into creating a stable and fixed ILS by adding designated locations, improving technical equipment (including the wi-fi connection), and creating additional collaborative and creative spaces on campus.

Both focus groups discussed the limited availability of permanent ILS that do not adequately facilitate group work, which is essential for many student projects. The dispersed location of learning environments across cities within the same faculty may make it less of a priority to have a dedicated ILS since the classes have the potential to change locations each academic year, thus requiring different resources or needs.

References

https://archidiap.com/opera/regia-scuola-superiore-di-architettura-di-valle-giulia/

Orizzontale https://www.orizzontale.org/en/portfolio_page/cento

Appendix A – Student survey

Item and scale analysis for every university

Akdeniz University Antalya

Name of Scale	Number of Items	Mean	Distri-bution	item-total-correlation	Reliability of scale (Cronbachs Alpha)
FL_Availability	3	ok	ok	ok	0,76
FL_Accessibility	4	ok	ok	Ok, except FL_AC_2 0,81, reliability without FL_AC_2 0,76, accepted	0,87
FL_Satisfaction	2	ok	ok	ok	0,82
CL_Availability	3	ok	ok	ok	0,84
CL_Accessibility	4	ok	ok	Ok, except CL_AC_2 0,85, reliability without CL_AC_2 0,83	0,89
CL_Satisfaction	2	ok	ok	ok	0,85
Satisfaction university campus	6	ok	ok	ok	0,87
Belongingness to your university	6	ok	ok	Not ok, B_U_2 -0,13, reliability without B_U_2 0,75	0,63 (6 item scale) 0,75 (5 item scale)
Satisfaction with interpersonal relationships	6	ok	ok	ok	0,88
Well-Being	5	ok	ok	Ok, except W_1 0,82 and W_3 0,83, accepted	0,89

HTW Berlin

Name of Scale	Number of Items	Mean	Distri-bution	item-total-correlation	Reliability of scale (Cronbachs Alpha)

FL_Availability	3	ok	ok	ok	0,81
FL_Accessibility	4	ok	ok	ok	0,85
FL_Satisfaction	2	ok	ok	ok	0,83
CL_Availability	3	ok	ok	Ok, except CL_AV_2 0,80, alpha without CL_AV_2 0,77, accepted	0,87
CL_Accessibility	4	ok	ok	Ok, except CL_AC_2 0,82, alpha without CL_AC_2 0,83	0,88
CL_Satisfaction	2	ok	ok	ok	0,85
Satisfaction university campus	6	ok	ok	ok	0,90
Belongingness to your university	6	ok	ok	Ok, except B_U_2 0,24, alpha without B_U_2 0,79	0,76 (6 item scale) 0,79 (5 item scale)
Satisfaction with interpersonal relationships	6	ok	ok	ok	0,89
Well-Being	5	ok	ok	ok	0,87

Mykolo Romerio universitetas – Vilnius

Name of Scale	Nr. Items	Mean	Distrib.	item-total-correlation	Reliability of scale (Cronbach)
FL_Availability	3	Ok, except FL_AV_1 and FL_AV_2 mean > 4,2	ok	Ok, except FL_AV_1 0,82, alpha without FL_AV_2 0,84 and FL_AV_2 0,84, alpha without FL_AV_2 0,84	O,90
FL_Accessibility	4	Ok, except FL_AC_1 and FL_AC_2 and FL_AC_1 and FL_AC_3 mean > 4,2	ok	Ok, except FL_AC_3 0,81, alpha without FL_AC_3 0,83	0,89
FL_Satisfaction	2	ok	ok	Not ok: FL_S_1 0,87,and FL_S_2 0,87	0,93
CL_Availability	3	Ok, except CL_AV_1 and CL_AV_2 mean > 4,2	Not ok	Ok, except CL_AV_1 0,81, alpha without FL_AV_1 0,84 and CL_AV_2 0,81, alpha without CL_AV_1 0,85 and	0,90
CL_Accessibility	4	Ok, except CL_AC_1 and CL_AC_2 mean > 4,2	Not ok	Not ok, CL_AC_1 0,86, alpha without item 0,94; CL_AC_2 0,91, alpha without item 0,93; CL_AC_3 0,90, alpha without item 0,93; CL_AC_4 0,87, alpha without item 0,94	0,95
CL_Satisfaction	2	Ok, except CL_Satisfaction_1 mean > 4,2	ok	Not ok, CL_Satisfaction_1 0,82,and CL_Satisfaction_2 0,82	0,83
Satisfaction university campus	6	ok	ok	Ok, except S_U_C_1 0,83, alpha without item 0,90 and except S_U_C_2 0,81, alpha without item 0,90 and except S_U_C_3 0,81, alpha without item 0,90 and except S_U_C_4 0,82, alpha without item 0,90	0,92
Belongingness to your university	6	ok	ok	Ok, except B_U_2 0,26, alpha without B_U_2 0,79	0,77 (6 item scale) 0,79 (5 item scale)
Satisfaction with interpersonal relationships	6	ok	ok	Ok	0,89
Well-Being	5	ok	ok	Ok, except W_3 0,82, accepted	0,92

Sapienza Università – Rome

Name of Scale	Number of Items	Mean	Distri-bution	item-total-correlation	Reliability of scale (Cronbachs Alpha)

FL_Availability	3	ok	ok	ok	0,81
FL_Accessibility	4	ok	ok	ok	0,82
FL_Satisfaction	2	ok	ok	ok	0,70
CL_Availability	3	ok	ok	Ok, except CL_AV_2 0,82, alpha without FL_AV_2 0,74	0,86
CL_Accessibility	4	ok	ok	ok	0,83
CL_Satisfaction	2	ok	ok	ok	0,76
Satisfaction university campus	6	ok	ok	ok	0,89
Belongingness to your university	6	ok	ok	Ok, except B_U_2 0,25, alpha without B_U_2 0,87	0,84
Satisfaction with interpersonal relationships	6	ok	Ok, except S_IR_2	ok	0,89
Well-Being	5	ok	ok	ok	0,87

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Name of Scale	Number of Items	Mean	Distri-bution	item-total-correlation	Reliability of scale (Cronbachs Alpha)
FL_Availability	3	ok	ok	ok	0,78
FL_Accessibility	4	ok	ok	Ok, except FL_AC_1 0,82, alpha without FL_AC_2 0,88; and FL_AC_2 0,90, alpha without FL_AC_2 0,86	0,91
FL_Satisfaction	2	ok	ok	ok	0,82
CL_Availability	3	ok	ok	Ok, except CL_AV_1 0,85, alpha without CL_AV_2 0,85; and CL_AV_2 0,84, alpha without CL_AV_2 0,86	0,91
CL_Accessibility	4	ok	ok	Ok, except CL_AC_1 0,87, alpha without CL_AC_2 0,90; and CL_AC_2 0,870, alpha without CL_AC_2 0,70	0,96
CL_Satisfaction	2	ok	ok	Not ok, CL_Satisfaction_1 0,81,and CL_Satisfaction_2 0,81	0,89
Satisfaction university campus	6	ok	ok	ok	0,88
Belongingness to your university	6	ok	ok	Ok, except B_U_2 0,17, alpha without B_U_2 0,82	0,78
Satisfaction with interpersonal relationships	6	ok	ok	ok	0,89
Well-Being	5	ok	ok	Ok, except W_2 0,87 and W_3 0,85, accepted	0,90

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Appendix B – Focus groups/interview

Interview guide – students:

Questions for the focus group interviews with students

Duration of focus groups: 100 minutes

In advance	**In advance, students get the campus maps, information regarding the project, and aspects which will be discussed in the focus groups** One/two weeks before the focus group: Contact the participants and ➢ Definition of informal learning places and focused/collaborative learning, ➢ ask them to fill out the survey (Word, PDF, paper&pencil) ➢ ask them to take pictures of their preferred learning places on campus ➢ send the Consent Form
Welcome, presentation of the project, agenda for the focus group	**15 min** Welcome! - Project NIILS (informal, inclusive learning environments) - Participants with fewer opportunities - Voluntariness, anonymity, confidentiality of all statements Short self-presentation of participants (warm-up) Name, study program, semester, where do I live, Show your picture(s) of your preferred learning places on campus
c) **used informal or non-conventional learning spaces** on students' knowledge acquisition: **Satisfaction** with the support and the learning environment	**Informal learning environments (20 min)** Definition "Informal learning spaces, […], are places of learning which can be selected independently by differentiated and self-organizing actors […]." (translated from Ninnemann & Jahnke, 2018, p.141) What places do you use for informal learning? ➢ a map of the campus and mapping of the important learning places

Map and Photos at MURAL-Board	➢ Photos of preferred learning spaces on campus ➢ green cards for focused learning activities ➢ blue cards for collaborative learning activities ***find the Link to the MURAL Board at the end of this document** In-depth questions (supported quantitatively, if necessary, or via point polling on the facilitation wall/flipchart): ➢ red dots for important places to learn ➢ Frequency of use in the last four weeks (favorite or most important place to learn?) ➢ Satisfaction with the most important/most frequently used learning location (strengths/weaknesses)
d) Existing **inequalities and barriers** related to informal or non-conventional learning spaces, including access to technical equipment and the internet as well as to physical-spatial environments conducive to learning and well-being	**In-depth inequalities and barriers (20 min)** ➢ Look at the most frequently / preferred learning places and tell us about the existing barriers: ➢ What are the barriers that you face in accessing informal learning places? ○ Possible answers: opening hours, registration /controlled access, physical barriers) ➢ Are there any obstacles regarding the availability of informal learning places? ○ Possible answers: not enough places, too crowded, environmental factors (light, temperature, acoustic, air), atmosphere/well-being, technological infrastructure (plugs, wifi) ➢ In the project, we also focus on students with "fewer opportunities". We have a broad perception of fewer opportunities, including a wide range of aspects: Physical impairment (e.g. mobility, visual, auditive); Chronic somatic disease (e.g. multiple sclerosis, cancer, diabetes); Mental disease (e.g. Burnout); Learning disabilities (e.g. Dyslexia, Dyscalculia, ADHD); Cultural differences (e.g. different cultural background to my university); Language (I do not study in my mother tongue.); Economic obstacles (e.g. financial barriers); Need to work for a living while studying; Family-related obstacles (e.g. responsible for children or nursing cases); Geographic obstacles (e.g. remote residence); Age: Think again, what are the barriers? What have you experienced yourselves?

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e) Students' and lecturers' **awareness and enabling strategies** to deal with existing inequalities and barriers	**Awareness and existing strategies to decrease inequalities (15 min)** ➢ What do you think: Are your lecturers and the university administration know these barriers? ➢ Are you aware, or do you know if anything is being done to break down these barriers? ➢ What could be done in the future to reduce these barriers?
Hybrid and virtual learning activities	**Definition Hybrid Activities:** combining activities concerning space (physical and virtual spaces) and time (synchronous and asynchronous activities; see Reinmann, 2021, S. 4) *Examples:* students meet partly physical and remote to discuss a presentation (e.g. Zoom), and students work together on a document (e.g. file sharing). Students get course material after class via the university provided learning platform (e.g. Moodle) **Hybrid and virtual learning activities (20 min)** Hand out the following questions as a questionnaire or prepare them in the MURAL Board or on the moderation wall. In-depth questions: 1. Can integrating services in the virtual space (apps, etc.) help you overcome barriers you are facing when using the campus? 2. How could an online platform make interacting within a physical space easier? 3. If you are in a physical environment, how could an online platform make it easier to interact with other students or colleagues who are over distance?
Summary, open questions by the participants, acknow-ledgement, and farewell	**10 min**

Interview Guide – Lecturers:

Questions for the focus group interviews with lecturers

Duration of focus groups: 90 minutes

Welcome, presentation of the project, agenda for the focus group	**Welcome 15 min** – Welcome the participants – Collect the Consent Form – Start the audio transcription – Give information about the NIILS Project (informal inclusive learning environments) and the focus group – Participants are lecturers from different status groups (professor, lecturer, research associate) – Conditions are: Voluntariness, anonymity, confidentiality of all statements – Short self-presentation of participants (warm-up): name, faculty/study program, professional background, which campus working/teaching
c) **used informal or non-conventional learning spaces** on students' knowlegde acquisition: **Satisfaction** with the support and the learning environment **Campus Map on Mural or on moderation wall** (if lecturers do not know any spaces, you might use pictures)	**Informal learning environments (15 min)** – Which spaces for informal learning environments do you know? (Mark the spaces with dots on a Campus Map on MURAL or on a moderation wall) – How do the students use these spaces? Which spaces are used for focused learning activities? Which spaces are used for collaborative (community/group) learning activities? – What places do you use for meetings/interaction with students outside of courses and formal teaching situations? – Are you satisfied with the existing informal learning places for students? ● If yes, why? Which characteristics are satisfactory? ● If no, why not? What are the reasons?
d) Existing **inequalities and barriers** related to informal or non-conventional learning spaces, including access to technical equipment and internet as well as to physical-spatial environments conducive to learning and well-being	**In depth inequalities and barriers (15 min)** ➢ How do you evaluate the **access** to existing informal learning places on campus and in the surrounding? ➢ Are you aware about any barriers that students face in accessing the informal learning spaces you mentioned? ○ Examples: opening hours, registration /controlled access, physical barriers ➢ How do you evaluate the **availability** of existing informal learning places? ➢ Are there any obstacles regarding the availability of informal learning places? ○ Examples: not enough places, too crowded, environmental factors (light, temperature,

PPT: List of categories for fewer opportunities	acoustic, air), atmosphere/well-being, technological infrastructure (plugs, wifi) – Now we want you to consider the **students with fewer opportunities** which can be identified as: ... (Read out/present categories out of the survey for students with "fewer opportunities") ○ Physical impairment (e.g. mobility, visual, auditive); Chronic somatic disease (e.g. multiple sclerosis, cancer, diabetes); Mental disease (e.g. Burnout); Learning disabilities (e.g. Dyslexia, Dyscalculia, ADHD); Cultural differences (e.g. different cultural background to my university); Language (I do not study in my mother tongue.); Economic obstacles (e.g. financial barriers); Need to work for living while studying; Family related obstacles (e.g. responsible for children or nursing cases); Geographic obstacles (e.g. remote residence); Age: – Are you aware if any of these groups of students face challenges in accessing and using the informal learning places? Have you observed any difficulties and barriers for these groups of students? If yes, what type of challenges?
e) Lecturers' **awareness and enabling strategies** to deal with existing inequalities and barriers	**Awareness and existing strategies to decrease inequalities (15 min)** – What do you think: Are these barriers known by your students and the university administration? – Are you aware or do you know if anything is being done to break down these barriers? – What could be done in the future to reduce these barriers? – Which strategies would decrease existing inequalities and barriers in accessing and using the informal learning spaces?
Hybrid and virtual learning activities PPT: List of in-depth-questions	**Definition Hybrid Activities:** combining activities with regard to space (physical and virtual spaces) and time (synchronous and asynchronous activities; see Reinmann, 2021, S. 4) *Examples:* students meet partly physical and remote discussing a presentation (e.g. Zoom), students work together on a document (e.g. file sharing). Students get course material after class via the university provided learning platform (e.g. Moodle)

	Hybrid and virtual learning activities (15 min) Hand out the following questions as a questionnaire or prepare them in the MURAL Board, on the moderation wall or in a power point presentation. In-depth questions: 4. Can the integration of services in the virtual space (apps, etc.) help students to overcome barriers they are facing when using the campus? 5. How could an online platform make interacting within a physical space easier? 6. If students are in a physical environment, how could an online platform make it easier for them to interact with other students who are over distance?
Summary, open questions by the participants, acknowledgement and farewell	**15 min**

Coding list

The table below lists the deductive codes/subcodes (additional codes/subcodes arose inductively).

Codes	Subcodes
Informal Learning Spaces on Campus	Focused Informal Learning Spaces
	Collaborative Informal Learning Spaces
	Informal Learning Spaces Used for Meetings
	Satisfaction
Barriers to Access	Opening Hours
	Registration/Controlled Access
	Physical Barriers
Barriers to Availability	Limited Availability/Crowded
	Atmosphere/Well-being
	Technological Infrastructure
Awareness of Barriers	Barriers to SWFO
Strategies to Mitigate Barriers	

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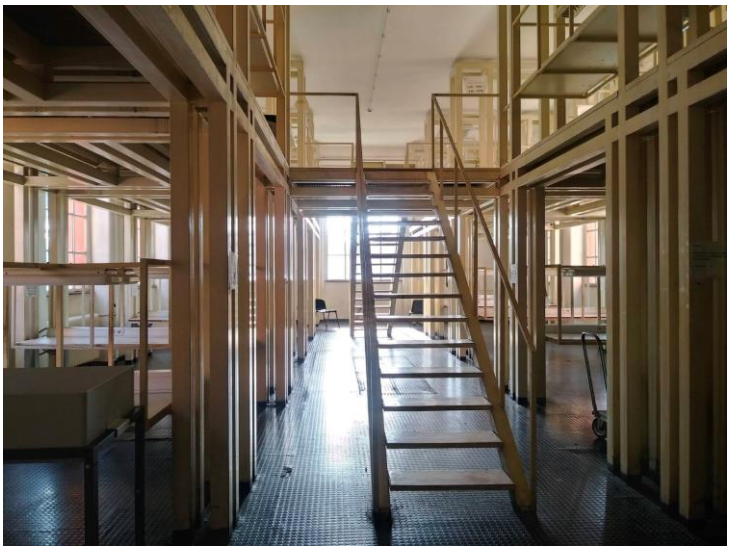
Support through Virtual Spaces	Hybrid Groupwork

Appendix C – Images of locations

Library



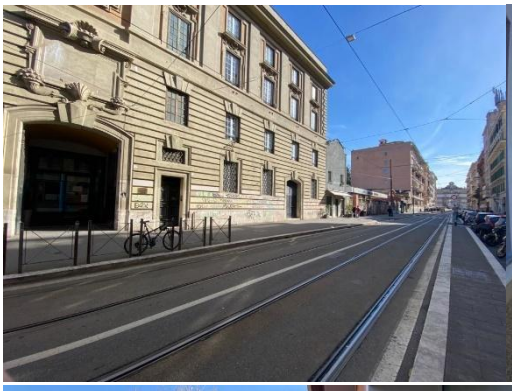
Picnic Tables

Gramsci/ Valle Giulia

Hallway

Gianturco

Flaminia





Piazza Borghese (Fontanella Borghese)