Report Users' Perspective Analysis

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

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Introduction

The *Hochschule für Technik und Wirtschaft Berlin* (HTW Berlin, transl.: University of Applied Sciences) was founded in 1994 and currently employs more than 500 university staff while serving more than 14,500 students on two campuses. At this, it is the largest state-owned university of applied sciences in Berlin. It offers a range of 70 different possible studies within five faculties: FB1) Engineering - Energy and Information, FB2) Engineering - Technology and Life, FB3) Economics and Law, FB4) Computer Science, Communication and Economics and FB5) Culture and Design According to the annual university ranking by *WirtschaftsWoche*, HTW's offered studies in business administration, electrical engineering, computer science, mechanical engineering, business informatics and industrial engineering were among the top 3 universities of applied sciences in Germany in 2022 (cf. HTW Berlin, 2022).

The two campuses are called *Campus Wilhelminenhof (WH)* (district Treptow-Köpenick) and *Campus Treskowallee (TA)* (district Karlshorst) in Berlin. Faculty 3 is located at Campus TA, whereas the remaining faculties FB1, FB2, FB4 and FB5 are located at Campus WH.

Figure 1 below portrays an overview of the two campuses of HTW Berlin:

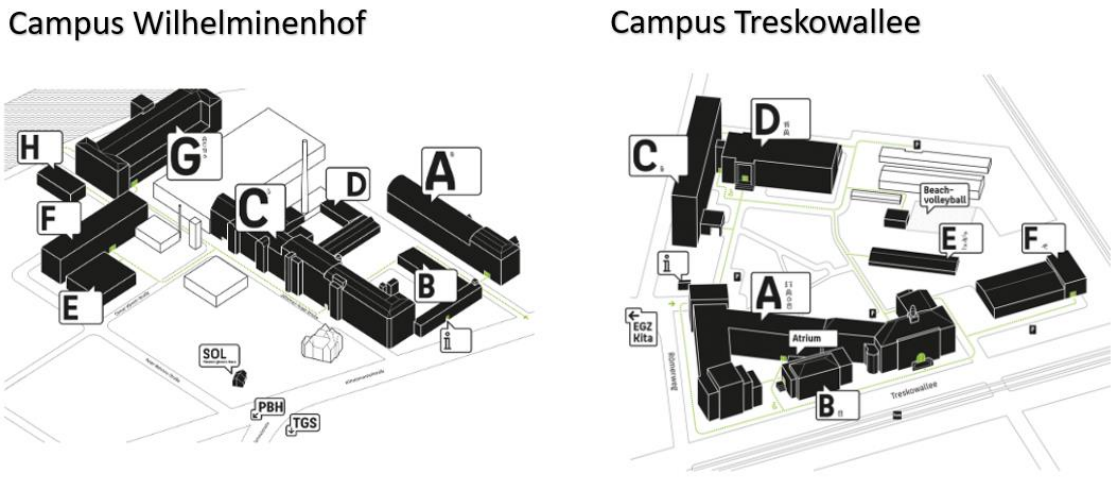

Figure 1. Map of Campus Wilhelminenhof and Campus Treskowallee at HTW Berlin. Reprinted from HTW Berlin by HTW Berlin, 2023, URL: https://www.htw-berlin.de/en/campus/wilhelminenhof-campus/ URL [Last Access: 2/8/2023]

Whereas informal learning spaces can be distinguished between "first places (home), second places (at the university), and third places (public settings)" (Beckers et al., 2016, p. 10), this user analysis aims to examine which places are used by HTW-students most frequently for informal learning activities. Particularly with regard to *second places,* different frequencies of use concerning possible learning environments on campus, such as seminar rooms, interspaces (corridor, foyer, niches, assembly hall), student lounges/work areas, the canteen/cafeteria, the university library and outside spaces on campus are investigated. Additionally, the use of *first places* (home) and *third places* (public places) such as public libraries, public transport, cafés, outdoors (e.g. park, beach, forest, lake) and temporary accommodations (e.g. hotels, guesthouses, etc.) are also investigated (cf. Beckers et al., 2015, pp. 145–146).

Methodology (student survey and focus groups)

The research approach combines quantitative (student survey) and qualitative (focus groups) methods. The investigated variables are in line with the project handbook. Table 1 below outlines the variables 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, 2022).

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 A).

The report is structured as follows:

(1) First, the descriptive results of the student survey are described.

(2) Secondly, hypotheses testing results as part of the student survey are presented.

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

Student survey: thematic structure of the survey

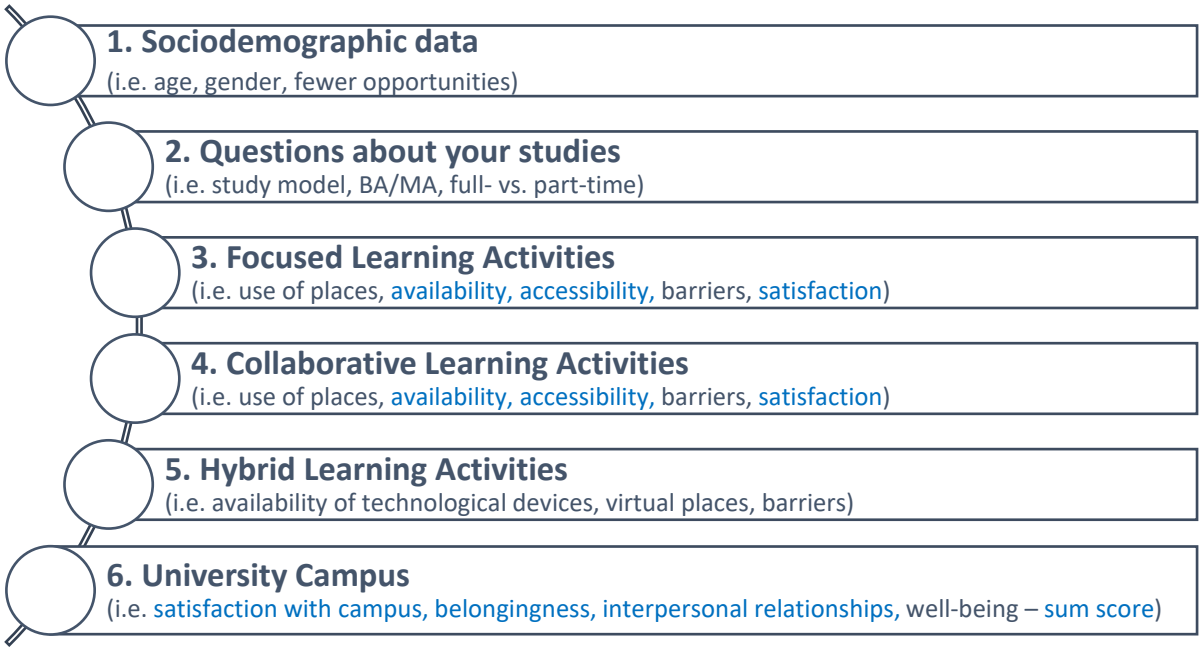

Figure 2. Thematic structure of the survey (blue marked variables are subjective variables which are summarized to a scale after an item and scale analysis) (self-created, 2023).

Descriptive analysis of the student survey

Firstly, data was transferred from the survey tool (Unipark) into an 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 (see Appendix A).

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 HTW Berlin **n = 327** students participated in the survey. Sample size may vary slightly among questions, since not every question was mandatory and answered by every participant.

Regarding the gender, 52% of female students and 42% of male students participated. About 6% chose the options “diverse”, “prefer not to say” or skipped this question.

Half of the students were between 21 – 25 years old (51%). About 20% were up to 20 years and 20% between 26 – 30 years. Only 9% were older than 30 years. Only 11% stated that they are living in a household with minor children or persons in need of care, which fits to the young sample of participants who are predominantly in the beginning of their twenties.

The living situation is very diverse (see Figure 3). Most of the students stated to live at their parents´ or relatives´ house (29%). Every fifth student stated to share a flat with others, to live with a partner or alone, whereas every tenth student claimed to live in a student dormitory.

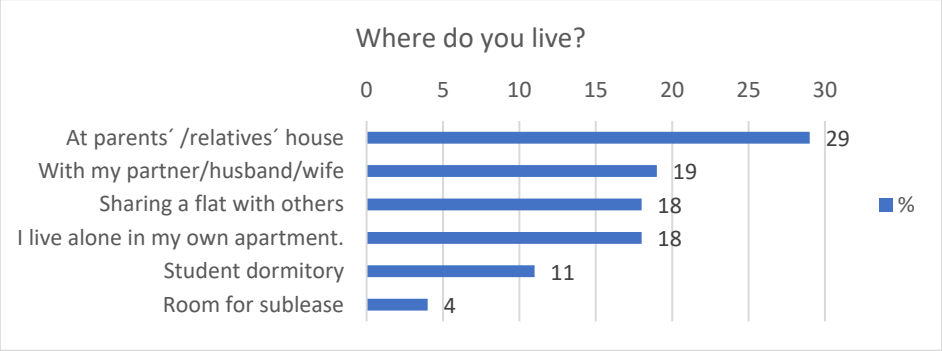

Figure 3: Living situation (n = 327).

Students stated a lot of personal challenges (see Figure 4). The most prominent one is the “need to work for living while studying” (46%). In addition, an alarmingly amount of 19% report to suffer from “mental diseases”. Every other challenge is experienced between 3% to 16% of the participants. Only 28% percent report to experience “none of these” challenges.

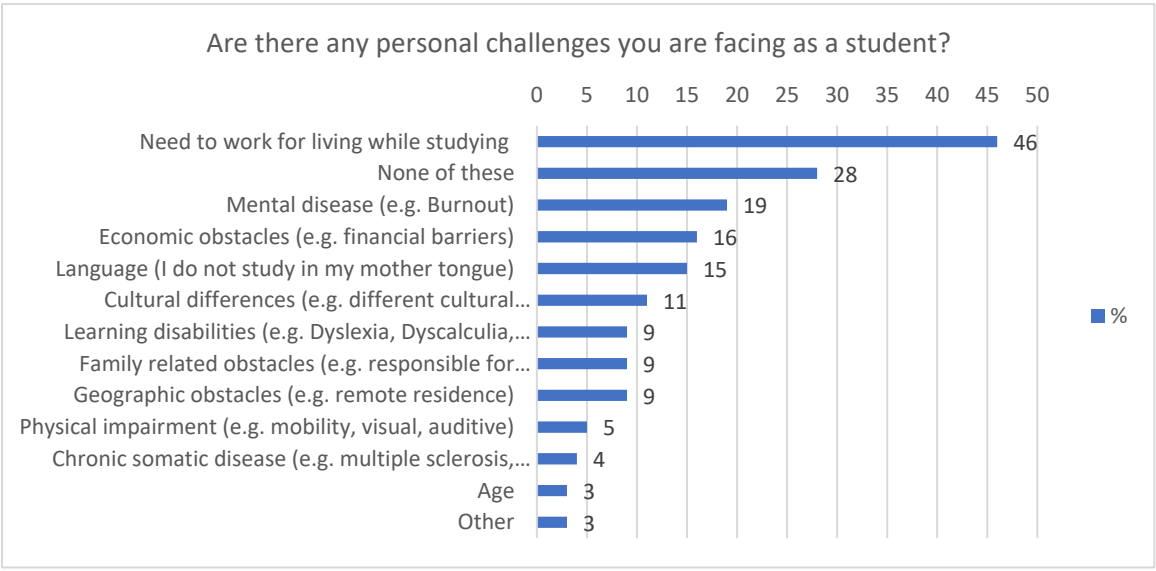

Figure 4: Personal challenges (students with fewer opportunities) (n = 327).

Questions about studies

Regarding the "distance to university" most students commute between 11 – 30 km (37%), followed by 5 – 10 km (36%) to their campus. Only 17% live close by (0 – 4 km). About 10% live more than 30 km away.

Three quarter of participants are aiming at a Bachelor´s degree (77%), one quarter is aiming at a Master´s degree (22%). Most of the students study full-time (94%) and they study in presence on campus (93%).

According to the full-time study model, most students state to spend about 21-30 hours per week on their studies (39%). Around 20% report 16-20 hours per week, more than 30 hours per week or less than 16 hours per week, respectively.

Students were enrolled mostly in 2021 (38%), 2020 (23%) or 2019 (15%).

There are two prominent fields of study in this sample (see Figure 6). Students at HTW berlin mostly study "Business, Administration and Law" (40%) and "Engineering, Manufacturing and Construction" (35%).

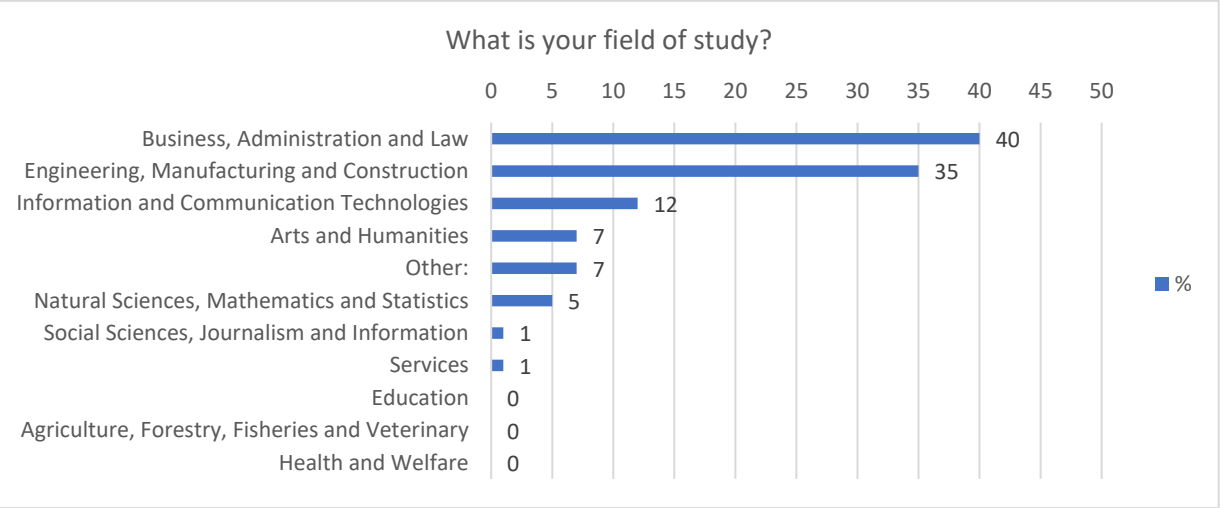

Figure 5: Field of study (n = 327)

Focused learning activities

Students were asked at which places they conduct focused learning activities (see Figure 6). The most prominent place to conduct focused learning is "The place where I live" (mean = 4,3), according to students. Every other place is less mentioned, e.g. the "University canteen" (mean = 2,5), "Seminar rooms" (mean = 2,3) or the "University library" (mean = 2,2).

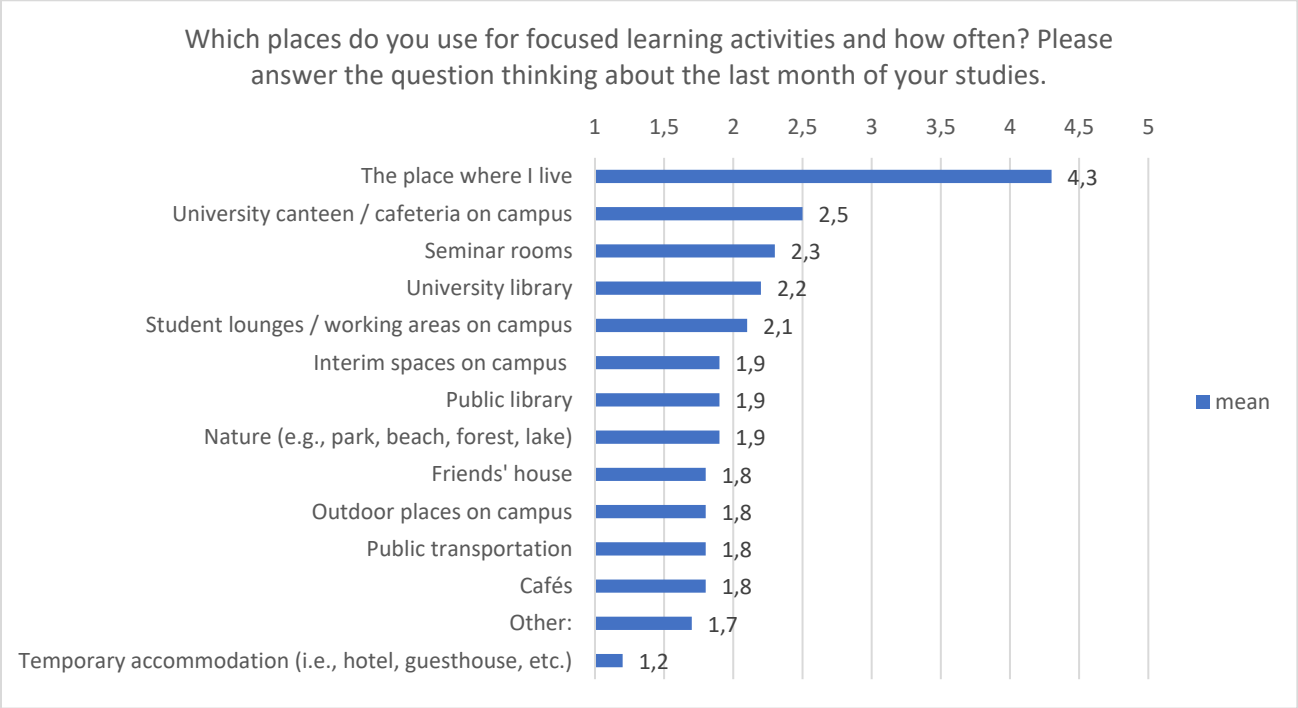

Figure 6: Places used for focused learning activities (n = 327)

Notes: 1 = never, 2 = rarely, 3 = occasionally, 4 = often, 5 = very often

The item and scale analyses were conducted, whereof the results are presented in Table 2. Students were asked to rate the availability and accessibility of focused learning spaces (see Figure 9). Here, accessibility is slightly better rated (mean = 3,51) than availability (mean = 3,38).

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	0,85
FL_Satisfaction	2	ok	ok	ok	0,83

Table 2. Item and scale analysis for focused learning activities.

Name of Scale	Mean	SD
FL_Availability	3,38	1,00
FL_Accessibility	3,51	0,92
FL_Satisfaction	3,15	1,05

Table 3. Descriptive statistics of focused learning activities.

Notes: 1 = totally disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = totally agree

Students report a lot of obstacles regarding focused learning activities. Most of all, 64% state "limited availability (e.g. too crowded)" as an obstacle. About 58% perceive the "opening hours" as a barrier to use focused learning spaces. Obstacles concerning registration (15%), difficulties in accessing (8%) or others (10%) are less mentioned (see Figure 7).

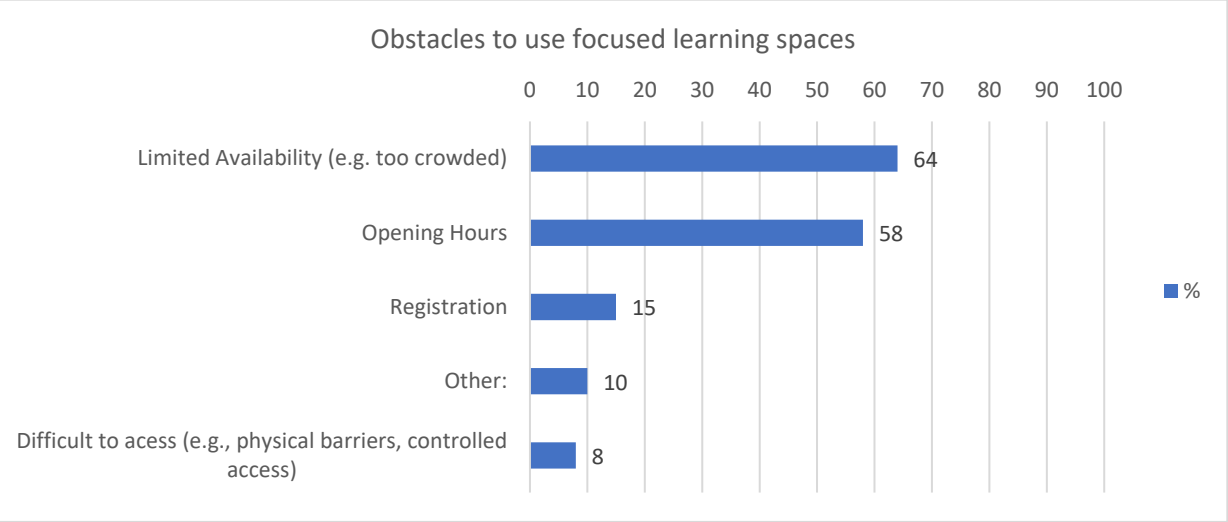

Figure 7. Obstacles to use focused learning activities.

Collaborative learning activities

Students were asked which places they use to conduct collaborative learning activities (see Figure 8). Compared to focused learning activities there is not a single, most prominent place for collaborative learning activities. Students report different places, such as "the place where I live" (mean = 2,9), "university canteen" (mean = 2,8), "seminar rooms" (mean = 2,6), which are the same places mentioned as for focused learning activities.

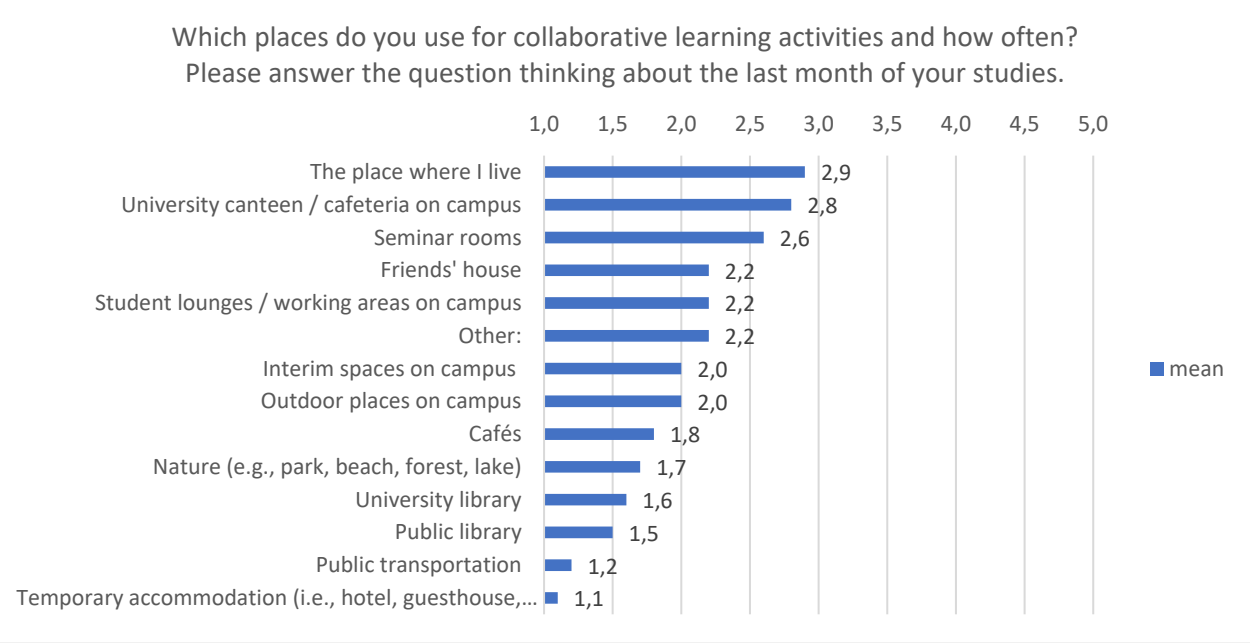

Figure 8: Places used for collaborative learning activities (n = 327)

Notes: 1 = never, 2 = rarely, 3 = occasionally, 4 = often, 5 = very often

The item and scale analyses were conducted, whereof results are presented in Table 4. There are two items which show high item-total correlations, indicating that items do not vary regarding their content as much as wanted. Nevertheless, all items were included in the scales. Students were asked to rate the availability and accessibility of collaborative learning spaces (see Table 5). There is no difference between accessibility and availability in terms of spaces used to conduct collaborative learning activities.

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 0,80, 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

Table 4. Item and scale analysis of collaborative learning activities.

Name of Scale	Mean	SD
CL_Availability	3,37	0,99
CL_Accessibility	3,44	0,97
CL_Satisfaction	3,16	1,02

Table 5. Descriptive statistics of collaborative learning activities.

Notes: 1 = totally disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = totally agree

Accordingly, students report a great deal of obstacles regarding collaborative learning activities (see Figure 9). Most of all, 68% state "limited availability (e.g. too crowded)" as an obstacle. About 50% perceive the "opening Hours" as a barrier to use collaborative learning spaces. Registration (16%), difficulties in accessing (9%) or others (11%) are less mentioned. These percentages are very similar to the obstacles reported for spaces to conduct focused learning activities.

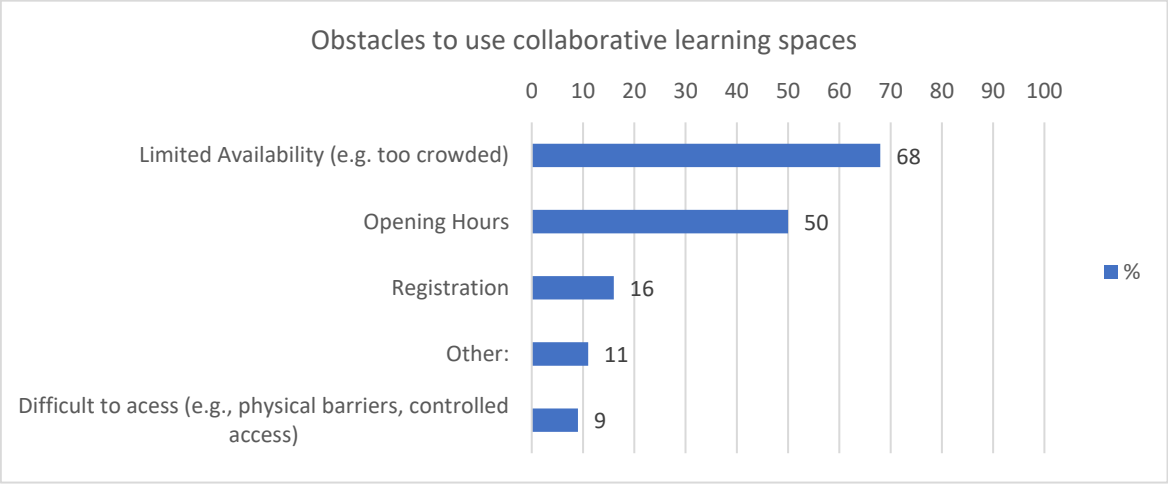

Figure 9. Obstacles to use collaborative learning activities

Hybrid learning activities

Students were asked about the devices they have available for their studies. About 94% state that they have a laptop/notebook/netbook, 88% have a smartphone and 40% have a tablet. E-book reader (6%) or other devices (3%) are less mentioned.

About 88% state that they have access to WIFI on campus and most of them are satisfied with the WIFI quality (80% agree).

When it comes to using virtual spaces for studying, most students use “messenger services, i.e. WhatsApp” (mean = 4,3), “learning management systems, i.e. Moodle” (mean = 4,1), “video communication, i.e. Zoom” (mean = 3,6) or “online document management platforms, i.e. Google Docs” (mean = 3,6). Social media, online forums, online chats and augmented/virtual reality are less mentioned.

The top three of technological obstacles are with 52% the “lack of infrastructure (e.g. availability of plugs)”, 22% “outdated technology” and the “lack of knowledge” (16%) to use the provided technologies appropriately.

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

The item and scale analyses were conducted, whereof results are presented in Figure 15. For most scales, analysis results were satisfying. Only one item (B_U_2) had to be excluded.

Mean and standard deviations of scales are presented in Table 6.

Name of Scale	Number of Items	Mean	Distribution	item-total-correlation	Reliability of scale (Cronbach’s Alpha)
Satisfaction	6	ok	ok	ok	0,90
Belongingness	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)
Interpersonal relationships	6	ok	ok	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	3,56	0,84
Belongingness	2,89	0,81
Interpersonal Relationships	3,48	0,91
Well-Being	51,56	20,52

Table 7. Descriptive statistics of central dependent variables.

Notes: Satisfaction, Belongingness, Interpersonal Relationships: 1 = totally disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = totally agree; Well-being: 0 worst well-being – 100 best well-being, a cut-off score of ≤ 50 is used to assign a ‘screening diagnosis’ of depression)

Conclusion descriptive results

Our sample at HTW Berlin is representative to the student population at HTW Berlin concerning gender, age and field of study. Most of the surveyed students study full-time and aim at a Bachelor´s degree. They are in their first or second year of studies, mostly in the field of "Business, Administration and Law" (40%) and "Engineering, Manufacturing and Construction" (35%). We did not expect the reported high number of students suffering from mental diseases (19%).

We were surprised that many students reported to live at their parents' or relatives' house (29%) and that most students commute quite a distance to the university campus. These aspects might be relevant when interpreting the places used for focused and collaborative learning activities. Focused learning activities predominantly take place at home. Collaborative learning activities are not conducted in a specific place. The "university canteen" and "seminar rooms" are the most prominent ones for focused learning activities as well as for collaborative learning activities.

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 = 0,27 p < 0,001	r = 0,25 p < 0,001	r = 0,30 p < 0,001	r = 0,58 p < 0,001
Accessibility	r = 0,26 p < 0,001	r = 0,21 p < 0,001	r = 0,30 p < 0,001	r = 0,53 p < 0,001

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

All requirements are fulfilled.

Hypotheses 1a, 1b, 1c and 1d are supported.

The results indicate that there is a relationship between the availability and the accessibility of informal learning spaces on campus and positive consequences, i.e. university belongingness, interpersonal relationships, well-being and university campus satisfaction.

The results suggest that the university should invest in their informal learning spaces, thereby enhancing positive outcomes. Additionally, further aspects such as a higher belongingness will lead to a lower intention to quit studies and to recommend the university. Further, positive interpersonal relationships will enhance the inclusion of students, and in turn, lead to a better knowledge acquisition.

Nevertheless, results do not imply causal relationships. It might also be true that positive interpersonal relationships lead to a higher usage of informal learning spaces, and thereby, increasing the perception of the availability and accessibility. Additionally, students with a higher well-being might be able to use the university infrastructure more and perceive their university in a more positive way than students with a lower well-being.

To summarize, improving informal learning spaces on campus is a measure which is significantly related to positive effects. Thereby, availability and accessibility of informal learning spaces on campus should be fostered.

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	3,38	1,01	318	t (317) = 0,11, n.s.	0,01
Availability_CL	3,37	0,99	318		
Accessibility_FL	3,51	0,93	309	t (308) = 2,11, p < 0,05	0,12
Accessibility_CL	3,43	0,97	309		
Satisfaction_FL	3,17	1,05	306	t (305) = 0,28, n.s.	0,02
Satisfaction_CL	3,16	1,02			

Table 9. Results of hypothesis 2.

Notes: 1 = totally disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = totally agree

All requirements are fulfilled.

In Hypothesis 2 we wanted to see if there are any differences regarding availability, accessibility and satisfaction between informal focused learning spaces and informal collaborative learning spaces. Universities traditionally focus on cognitive and functional competencies, which are related to individual, focused learning spaces (e.g. reading, writing). The focus on social and personal competencies which are trained in collaborative learning spaces have been increasing in the last years, but are still less present (cf. Bohlinger, 2008). Therefore, we assumed that there is a higher availability, accessibility and satisfaction for focused learning spaces.

Results show that this is partly true. There were no differences concerning availability and satisfaction between the two types of informal learning spaces. But the accessibility of informal focused learning spaces is rated higher than the accessibility of informal collaborative learning spaces.

This result implies that universities should invest in informal collaborative learning spaces. Especially the accessibility (e.g. easy to reach, usable on short notice, no barriers) of informal collaborative learning spaces should be improved.

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 = 0,25, p < 0,001,	r = 0,21, p < 0,001	r = 0,28, p < 0,001	r = 0,55, p < 0,001
Availability_CL	r = 0,23, p < 0,001,	r = 0,25, p < 0,001	r = 0,28, p < 0,001	r = 0,51, p < 0,001
Accessibility_FL	r = 0,26, p < 0,001	r = 0,18, p < 0,001	r = 0,30, p < 0,001	r = 0,52, p < 0,001
Accessibility_CL	r = 0,24, p < 0,001	r = 0,23, p < 0,001	r = 0,27, p < 0,001	r = 0,50, p < 0,001

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

All requirements are fulfilled.

Hypotheses 3 assumed that there are more positive outcomes when looking at informal collaborative learning spaces compared to informal focused learning spaces. We tested these hypotheses by comparing the correlation coefficients Av_FL vs. Av_CL and Acc_FL vs. Acc_CL. Hypotheses 3a to 3d are not supported. The relationships are almost equal between FL und CL. These results imply that students rate the importance of informal focused and collaborative learning spaces similar. Probably, it is not only the learning activity itself but also the interaction with other students while meeting at the university.

Another reason for the results could be that students do not differ between availability and accessibility of focused and collaborative learning spaces as much as we expected. Indeed, almost all learning spaces can be used for both learning activities. The only exception is the library since students are usually asked to study in silence there.

This aspect leads us to the assumption that informal learning spaces should not be designed explicitly for one or the other learning activity. Informal learning spaces should allow a flexible and multifunctional usage. Students need transparency where to learn and where to find which informal learning spaces, but they are very flexible in using the spaces.

Discussion hypotheses testing

Hypotheses 1a to 1d are supported, indicating positive outcomes when improving availability and accessibility of informal learning spaces.

Hypotheses 2 is partly supported. The accessibility of informal collaborative learning spaces should be improved.

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

Conclusion quantitative data analysis

Results clearly show that informal learning spaces are a relevant factor for increasing belongingness, interpersonal relationships, well-being and university campus satisfaction. The strong relationships between the availability and accessibility of informal learning spaces, not only with related variables (e.g. belongingness to campus, satisfaction with campus), but even with overarching variables (e.g. interpersonal relationships, well-being) are convincing. It can be assumed that improving the quality on campus will support integrating students more and support increasing interactions between students which in turn will lead to a higher satisfaction and well-being. These complex relationships should be analyzed in further studies.

Focus groups/interviews: deductive themes

This chapter outlines how the research question is approached from a qualitative perspective, whereas the focus is on explorative research.

Table 11 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 with students and lecturers (self-created, 2022).

Thus, the themes capture the **use**, **availability** and **accessibility** of informal learning spaces on campuses, whereas **good practice examples** well as **existing barriers** will be presented in the following. Additionally, **strategies** for action, **wishes**, **goals** and **ideas** of stakeholders to promote informal learning spaces on campus will be exemplified.

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 B).

It was aimed to conduct at least one focus group interview with students (5-7 students, incl. three students with fewer opportunities) 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 B).

Student focus groups/interviews

Implementation

The focus group with students was conducted with five HTW Berlin students, thereof three students with fewer opportunities, on the 15th June 2022 (2 p.m. – 3.30 p.m.) remotely via ZOOM. The students interviewed predominantly studied at faculty 3, "HTW Business School", and pursued a bachelor degree, as shown in Table 12.

Students	Campus	Faculty	Degree
Student 1 (S1)	TA	3: HTW Business School (Human Resource Management)	Pursuing Master degree
Student 2 (S2)	TA	3: HTW Business School (Business Administration)	Pursuing Bachelor degree
Student 3 (S3)	TA	3: HTW Business School (Business Administration)	Pursuing Bachelor degree
Student 4 (S4)	TA	3: HTW Business School (Business Administration)	Pursuing Bachelor degree
Student 5 (S5)	WH	Not specified	Pursuing Master degree

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

Results

In the following, the results and key insights gathered from the focus group with students are presented according to the four interview themes' order.

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

Figure 10 and 11 below show an overview of students' knowledge and usage of informal learning spaces (ILS) on HTW Berlin's two campuses. The identified spaces include both, favourite and most frequently used ILS on campuses. The **orange** dots indicate the use of spaces for **unspecific informal learning activities**, whereas the **green** dots represent spaces used for **focused informal learning activities**. In comparison, the **blue** dots represent the spaces used for **collaborative informal learning** activities. Looking at the various dots' allocation, it becomes observable that students' knowledge and usage of ILS was higher for campus Treskowallee, which might be traced back to the fact that the majority of the students interviewed studied at faculty 3, located at campus Treskowallee.

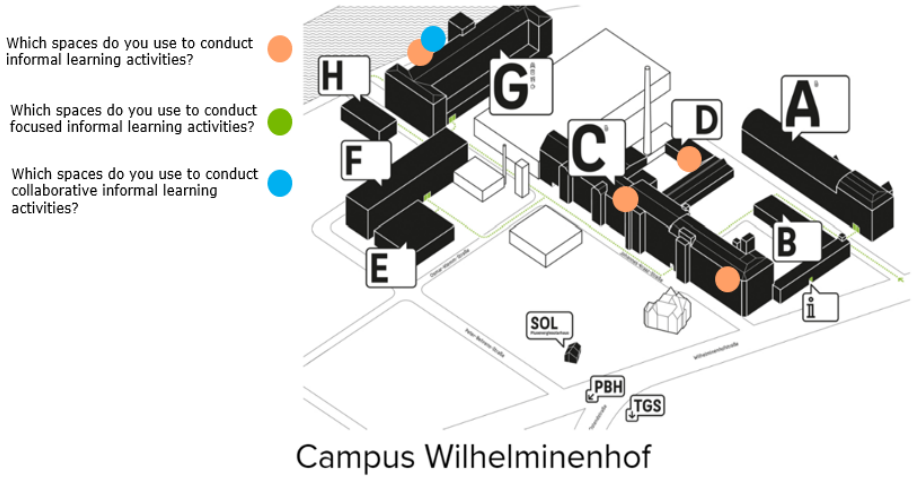

Figure 10. HTW campus WH map of informal learning spaces used by students (self-created, based on focus groups with students, 2022).

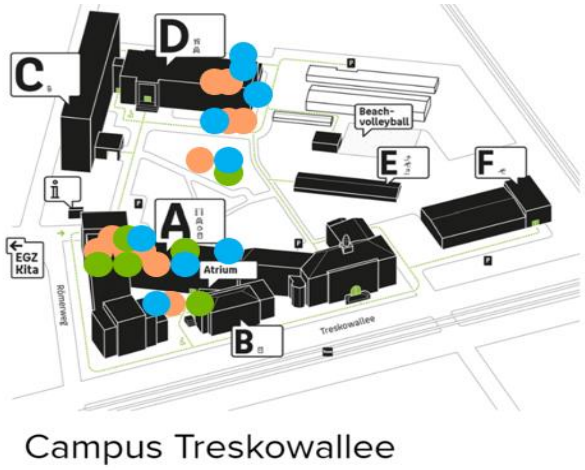

Figure 11. HTW campus TA map of informal learning spaces used by students (self-created, based on focus groups with students, 2022).

Accordingly, Table 13 lists the ILS identified and frequently used on both campuses by the students interviewed.

Campus/Building	Label	Indoor	Outdoor	Focused Learning	Collaborative Learning	Reference
TA A	Seminar rooms	x		x	x	cf. S3, 2022, ln. 111-112, 156-157; cf. S1, 2022, ln. 132; cf. S2, 2022, ln. 161-162.
TA A	Library	x		x		cf. S1, 2022, ln. 132, 153; cf. S4, 2022, ln. 170; cf. S4, 2022, ln. 125-126
TA A	Outdoor-yard		x	x	x	cf. S2, 2022, ln. 114-115, ln. 162-169.
TA A	Seating islands	x		x		cf. S4, 2022, ln. 137-141; cf. S3, 2022, ln. 158-159.
TA A	Hallway-seating	x			x	cf. S4, 2022, ln. 170-171.
TA D	Canteen (“Mensa”)	x			x	cf. S3, 2022, ln. 113; cf. S4, 2022, ln. 125, 160, 170-171; cf. S1, 2022, ln. 133-135, ln. 154.
TA D	Outdoor-canteen (“Mensa”)		x	x	x	cf. S2, 2022, ln. 114-121.
TA 0	Park		x	x	x	cf. S3, 2022, ln. 122-123; cf. S2, 2022, ln. 162-169.
WH C452	Creative Space	x		x	x	cf. S1, 2022, ln. 488-498.
WH D	Beach		x		x	cf. S1, 2022, ln. 135-136, ln. 155.
WH D007	Laboratories	x		x	x	cf. S5, 2022, ln. 684-685.

Table 13. Important informal learning spaces at HTW Berlin as identified by students (self-created, based on focus groups with students, 2022).

Table 13 shows that students identified the following **informal focused learning spaces:**

- the library (cf. S1, 2022, ln. 132, 153; cf. S4, 2022, ln. 170; cf. S4, 2022, ln. 125-126) and
- the seating islands (cf. S4, 2022, ln. 137-141; cf. S3, 2022, ln. 158-159) at campus TA,

and the following spaces as **informal collaborative learning spaces:**

- the indoor canteen (cf. S3, 2022, ln. 113; cf. S4, 2022, ln. 125, 160, ln. 170-171; cf. S1, 2022, ln. 133-135, ln. 154),
- the hallway seating areas (cf. S4, 2022, ln. 170-171) at campus TA and
- the beach at campus WH (cf. S1, 2022, ln. 135-136, ln. 155).

The majority of ILS on both campuses were identified for **both, focused and collaborative informal learning activities** by students. Those spaces are for instance **indoor** spaces, such as:

- seminar rooms at campus TA (cf. S3, 2022, ln. 111-112, ln. 156-157; cf. S1, 2022, ln. 132; cf. S2, 2022, ln. 161-162),
- a creative space (cf. S1, 2022, ln. 488-498), and
- laboratories at campus (WH cf. S5, 2022, ln. 684-685).

as well as **outdoor** spaces:

- such as the yard (cf. S2, 2022, ln. 114-115, ln. 162-169),
- the canteen's outdoor seating area (cf. S2, 2022, ln. 114-121),
- the park (cf. S3, 2022, ln. 122-123; cf. S2, 2022, ln. 162-169) at campus TA.

Please find photos of the identified ILS in Appendix B.

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

The students interviewed expressed themselves to a lesser extent concerning their satisfaction or strengths of favorite and/or most frequently used ILS. In turn, existing barriers and weaknesses concerning the **availability** of ILS on campuses and the **accessibility** of those identified were extensively covered during the focus groups. Thus, results regarding students' assessment of the ILS' availability and accessibility at HTW Berlin are summarized in the following.

2.1. Availability of informal learning spaces

Figure 10 and 11 show that students could spontaneously name a fair amount of ILS on both campuses that they know and/or frequently use. There were no complaints concerning the availability, in terms of the general number of ILS on campus, mentioned by the students interviewed.

However, when the students were asked to think of barriers to use the identified ILS, it became clear that the **availability of appropriate ILS** is restrained due to following factors:

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

Whereas the WIFI quality on campus was rated as "quite good" (transl. S4, 2022, ln. 286), there is little availability of plugs in seminar rooms (cf. S4, 2022, ln. 283-284; cf. S3, 2022, ln. 288; cf. S2, 2022, ln. 290). Students state that there are some but very few seminar rooms with suitable number of plugs, which are usually preferred. Thus, seminar rooms that provide good technological infrastructure are highly demanded (cf. S2, 2022, ln. 290-292).

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

- Example 1: Canteen

Even though the canteen seemed to be a frequently used informal learning space for group learning activities, students reported it to be very **busy** and **crowded** during break times, resulting in high noisiness-levels as a barrier to keeping concentration up to appropriately conduct informal learning activities in this place. Therefore, it was indicated that the canteen can only be used as an informal learning space effectively at certain times (cf. S2, 2022, ln. 212-214; cf. S4, 2022, ln. 302-303; cf. S3, 2022, ln. 463-471).

- Example 2: Hallway-seating areas

The same set of problems concern the hallway-seating areas. Students mention that they are good and quiet places to study during seminar and lecture times. However, they get quite **busy** and **noisy** during break times, making it difficult study undisturbed at in these locations (cf. S3, 2022, ln. 298-301).

- Example 3: Seminar rooms

The large number of seminar rooms on both campuses of HTW Berlin were mentioned as frequently used ILS for focused and collaborative learning activities by the students interviewed (cf. S3, 2022, ln. 111-112, ln. 156-157; cf. S1, 2022, ln. 132; cf. S2, 2022, ln. 161-162). However, students viewed the **actual number** of seminar rooms available during the day as a barrier since there is **no user-friendly overview of actually available seminar rooms** that can be used before and after the supervised seminars and lectures (cf. S1, 2022, ln. 203-207, 221-235; cf. S2, 2022, ln. 260; cf. S3, 2022, ln. 261-262, ln. 269-276; cf. S4, 2022, ln. 263).

c) Ambience (conditions promoting well-being)

Students preferred the canteen as opposed to the cafeteria for focused and collaborative informal learning activities as it is an open space that still provides a **sense of privacy** (cf. S3, 2022, ln. 533-537).

Accordingly, the availability of **gastronomic offers** on and off campuses were discussed as a factor positively contributing to the use of ILS. At this, it needs to be considered that **rules for eating and drinking vary** in different places. However, overall, the availability of gastronomic offers on campus WH were stated to be satisfying (i.e. good offers at university canteen, coffee bike on campus as well as bakeries and fast food nearby the campus) (cf. S5, 2022, ln. 518-

521; cf. S1, 2022, ln. 526-528). In turn, students were rather dissatisfied with the availability of gastronomic offers on and off campus at campus TA (cf. S3, 2022, ln. 523-525; cf. S1, 2022, ln. 526-528).
Correspondingly, having a **relaxed atmosphere,** described by studying **calmly**, having **privacy** and **everything at hand** (i.e., **basic needs**, such as **food**) was stated as an important factor for informal learning. According to that, a student explained that many students go home for informal learning, because they "**having everything at home**" and there are little spaces available on campus that meet students' needs.
At this, it was stated that even students without fewer opportunities prefer to work from home due to unavailability of appropriate ILS on campus (cf. S5, 2022, ln. 700-713).

Thus, it can be summarized that by looking only at the physical number of ILS on campus, it seems that the availability of ILS is theoretically sufficient. However, **in practice**, students report that in many existing ILS, the **possibility of use is limited**, as there are, for instance, no sockets, the places are not well insulated, there are different rules concerning the use of space. Hence, there is a **lack of overview and particularly variety in existing ILS**, which most notably concerns spaces for collaborative learning activities.

2.2. Access to informal learning spaces

Next to the limited availability of ILS that are appropriate for students on campus, **barriers to access those** were discussed. Here, barriers concerning restricted physical access (i.e. in terms of freedom of barriers on campus) were not thematized as problematic from the students' perspective. Instead, the following barriers were further discussed in detail:

a) Restricted opening hours

Students mentioned **restricted opening hours** as a physical barrier to accessibility on campus. Those concern for instance the library (cf. S1, 2022, ln. 202) and the canteen (cf. S3, 2022, ln. 208-211), both at campus TA (cf. S4, 2022, ln. 215).

b) Registration/controlled access

Accordingly, students reported the importance of particularly technologically enhanced learning spaces, such as computer rooms, to being freely accessible to students (i.e., unlocked and without controlled access) **faculty-independent** and **without registration**. This is on the one hand to increase the availability of accessible ILS and on the other hand to make technological equipment (such as computers) for everyone accessible, for instance group learning activities that require technological equipment. For instance, the interviewed students were not certainly sure about the access to those rooms in general (cf. S3, 2022, ln. 246-258; cf. S1, 2022, ln. 434-437).

c) Restricted access to information

Conversely, students reported most notably barriers concerning **access to information on the availability and accessible ILS** (in terms of spaces being unoccupied, open and free to use). These mainly concern the use of seminar rooms. Here, students state that they usually find out about the seminar rooms' availability and access on-site, applying **trial and error approaches** (i.e., going from door to door and checking whether seminar rooms are open/closed) (cf. S1, 2022, ln. 203-206).

Accordingly, students thematized the theoretical utilization of LSF, HTW's campus management system, as a tool to check occupancy, and thus accessibility, of seminar rooms (cf. S1, 2022, ln. 206-207). LSF provides, among others, a schedule when seminars/lectures take place in the respective seminar room of interest. Thus, LSF provides information if respective rooms of interest are blocked. However, students reported that using LSF as a room booking system is inappropriate due to its **missing user-friendliness** concerning lack of filtering options (i.e., location, only unoccupied rooms, etc.) [1] and that the trial and error method on-site would be even faster in implementation. For that reason, as of now **students cannot use LSF as an actual room booking system** (cf. S1, 2022, ln. 221-231, ln. 233-235; cf. S3, 2022, ln. 261-162, 269-276; cf. S4, 2022, ln. 263).

Additionally, students claimed to encounter further **inconveniences** concerning **finding** all **information** they need at one glance with regard to other ILS, such as the canteen or the library. Since opening hours of these ILS are usually restricted, as already discussed, there is an additional barrier of having a **poor overview** concerning those restrictions of any kind (cf. S3, 2022, ln. 569-577, ln. 592-598).

2.3. Students with fewer opportunities

In addition, the impact of SWFOs inequalities to use ILS on campus was examined. According to the definition of SWFO, **three students were identified as SWFO**. Thereof, all three students reported **geographical barriers**, either in the present or past, while needing to commute a long time to the campus (cf. S3, 2022, ln. 315-321). Additionally, two of the three SWFO reported to **work next to studying** (cf. S1, 2022, ln. 332-334; S2, 2022, ln. 327-331). However, those students reported to perceive these inequalities to be low to non-existent in terms of being a barrier to them (cf. S3, 2022, ln. 315-321; cf. S1, 2022, ln. 332-334; S2, 2022, ln. 327-331).

Nevertheless, when asking specifically if these inequalities influence the frequency of visiting the campus, SWFO reported a **direct relationship** of having these **inequalities** and **visiting the**

[1] In addition, rooms can only be booked by the university management, professors, lecturers and researchers but not by students. Here, even if professors, lecturers and researchers would like to book rooms, it must be done through the university administration.

campus and its ILS less. Most of all, commuting to the campus was perceived as a waste of time (cf. S1, 2022, ln. 338-342).

According to the students interviewed, even more fellow students face long commuting times to the campus. Thus, even group learning activities have been mostly conducted online (i.e., via WhatsApp or Zoom) since the pandemic (cf. S1, 2022, ln. 344-350). On the one hand, conducting group learning activities **online** was described as a **time-saver** and **convenient** concerning document sharing, yet on the other hand the online format was perceived to be very exhausting and tiring (cf. S1, 2022, ln. 354-363).

In addition, if students with geographical barriers have breaks between seminars and/or lectures, those students report to use ILS on campus to conduct focused and collaborative learning activities (cf. S2, 2022, ln. 371-378). However, if those students do not have breaks between seminars and/or lectures, they usually go home after (cf. S1, 2022, ln. 364-366; cf. S5, 2022, ln. 700-712). On the contrary, surprisingly, even students without fewer opportunities living close to the campus prefer studying at home and tend to leave the campus after seminars and/or lectures (cf. S5, 2022, ln. 449-453, ln. 700-712).

Given these points, it can be summarized that next to the little variety of existing ILS on campus, their accessibility is also restricted. Accordingly, **little variety plus restricted accessibility** of existing ILS on campus automatically **limit students' possibility to use** those places for informal learning.

Overall, in light of this information it seems **that students predominantly face administrative instead of physical barriers** concerning the availability and accessibility of ILS on campus.

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

Students believe that barriers are partially known by lecturers and/or the university administration as students noticed that the inappropriate library opening hours were discussed by the university management already for a long time (cf. S3, 2022, ln. 413-414; cf. S2, 2022, ln. 416-419). However, students claimed to not have witnessed any activities or actions to break down or diminish such barriers precisely (cf. S3, 2022, ln. 423).

In general, students assume that lecturers/the university administration are aware of inequalities and barriers to promote ILS on campus but a suitable solution has not been worked out yet (cf. S3, 2022, ln. 413-414).

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

In the following, students' ideas and potential plans to break these barriers and promote the use of ILS on campuses are summarized:

- Updating the **room booking system** to a user-friendlier version (cf. S3, 2022, ln. 429-433).

- Increase access to ILS applying identifiable **access via student-ID-card** (making access to specific rooms, such as computer rooms, possible at any time while trying to minimize vandalism due to possibility of backtracking) (cf. S3, 2022, ln. 436-440, cf. S5, 2022, ln. 441-446, 454-455).
- Offering **bookable, shielded informal collaborative learning spaces** specifically. Shielded in terms of smaller rooms for group work (for instance with a capacity for four people per room) to prevent sharing a large open space with many other groups at the same time (cf. S3, 2022, ln. 469-471; cf. S2, 2022, ln. 472-476; cf. S5, 2022, ln. 477-486).
- Offering more **creative spaces** on campuses, that provide different materials to work with and different furniture, such as lounge chairs, promoting creativity. Those spaces could be used in groups or individually (cf. S1, 2022, ln. 487-500).

According to that, students claim that implementing those ideas and potential plans to break barriers would overall attract them to use ILS on campuses more frequently (cf. S3, 2022, ln. 505-509; cf. S5, 2022, ln. 510-515).

4. Hybrid and virtual learning activities

a) Knowledge/support to find informal learning spaces on campus

As has been shown several times so far, students appear to be unsure concerning the availability and particularly accessibility of ILS across both campuses. Accordingly, students claim that their knowledge on ILS on campus is currently rather based on **insider knowledge** (cf., S5, 2022, ln. 602-609). Looking at Table 13, which lists predominantly informal spaces at campus TA, it becomes observable that the students interviewed (mostly students of campus faculty 3 at TA), almost exclusively know the ILS within their faculty. Accordingly, the only student studying at campus WH, confirms to exclusively know one specific room in one building on campus WH (cf. S5, 2022, ln. 684-685, ln. 717).

b) Enhancing interactions within the physical space

Based on the **lacking overview and transparency** of information shared on ILS on campus (as stated in 2.2., c), students claimed to **demand a digital overview** that summarizes the location in form of a **map** and the **opening hours** of ILS on campus (cf. S3, 2022, ln. 569-577; cf. S5, 2022, ln. 578, ln. 612-613; cf. S3, 2022, ln. 592-598). In addition, students further suggest an interactive informal learning space map that ideally updates itself and **marks available** and **accessible** ILS in green (cf. S5, 2022, ln. 578-583). Accordingly, students claim that such digital services would not only **help** them **finding** ILS on campus **on-site** but also to better **plan their informal learning activities in advance** (cf. S3, 2022, ln. 569-577; cf. S5, 2022, ln. 578-583).

c) Overcoming barriers in collaborative hybrid groupwork by integrating services into the virtual space

When students were asked how they usually work within a hybrid group setting, it became apparent that predominantly **existing, third-party tools and services** supporting **synchronous** as well as **asynchronous groupwork** are used (cf. S3, 2022, ln. 620-624).

1. Tools/services used for *synchronous* group work:
   - Zoom (cf. S3, 2022, ln. 620; cf. S5, 2022, ln. 629; cf. S5, 2022, ln. 666).
   - MS Teams (cf. S3, 2022, ln. 621).

2. Tools/services used for *asynchronous* group work:
   - Google Drive (cf. S3, 2022, ln. 622).

3. Tools/services used for *synchronous* and *asynchronous* group work:
   - Power Point Live (cf. S2, 2022, ln. 626-627; cf. S5, 2022, ln. 630-636, ln.663-665).
   - One Drive (cf. S5, 2022, ln. 630-636; cf. S1, 2022, ln. 637).
   - Miro Board (cf. S1, 2022, ln. 637-639).
   - WhatsApp (cf. S2, 2022, ln. 625; cf. S3, 2022, ln. 657; cf. S5, 2022, ln. 667).

In turn, the university-provided platforms, such as Moodle, is predominantly used regarding the communication between professors and students, which is mostly top-down from professor to students (cf. S5, 2022, ln. 642-650, ln. 662-667). Thus, Moodle is not used among students internally as it loses its competitiveness to third-party tools, such as WhatsApp, according to students (cf. S3, 2022, ln. 651-658).

However, concerning **hybrid group work on-site**, **students** claim to **demand accessible technologically enhanced ILS**. In case group presentations are required to be held on-site, access to spaces, where students can prepare for group presentations in terms of testing technology (connecting laptops to beamer) and practicing presenting in groups together, must be provided (cf. S5, 2022, ln.733-748; cf. S3, 2022, ln. 749-758; cf. S2, 2022, ln. 759-762).

Lecturer focus groups/interviews

Implementation

The focus group with four lecturers from HTW Berlin was conducted on the 13th June 2022 (4 p.m. – 5.30 p.m.) remotely via ZOOM.
Among the interviewees were two professors from and one researcher/lecturer from faculties located at campus WH, and one researcher/lecturer representing campus TA, as shown in Table 14.

Lecturers	Campus	Faculty	Position
Lecturer 1 (L1)	WH	5	Professor
Lecturer 2 (L2)	WH	2	Professor
Lecturer 3 (L3)	TA	3	Researcher/lecturer
Lecturer 4 (L4)	WH	2	Researcher/lecturer

Table 14. Overview of focus group participants – lecturers (self-created, 2022).

Results

In the following, the results and key insights gathered from the focus group with lecturers are presented according to the four interview themes' order, which is the same structure like the one of the previously analysed student focus group.

1. Impact of the used informal or non-conventional learning spaces on lecturers' knowledge acquisition

Accordingly, Figure 13 and 14 show an overview of lecturers' knowledge concerning students' usage of ILS on HTW Berlin's two campuses. The **orange dots** indicate the use of spaces for **unspecific informal learning activities**, whereas the **green dots** represent spaces lecturers know are used for **focused informal learning activities** by students. In comparison, **blue dots** represent the spaces known to be used for **collaborative informal learning activities**. In addition, the **purple dots** represent **ILS lecturers use to interact with students** (i.e., to have meetings), outside formal lectures and seminars.

Looking at the various dots' allocation, it becomes observable that lecturers' knowledge of students' ILS usage was higher for campus WH. This might be traced back to the fact that the majority of the lecturers interviewed are from faculties located at campus WH, which offset the underrepresentation of students from campus WH during the focus groups with students.

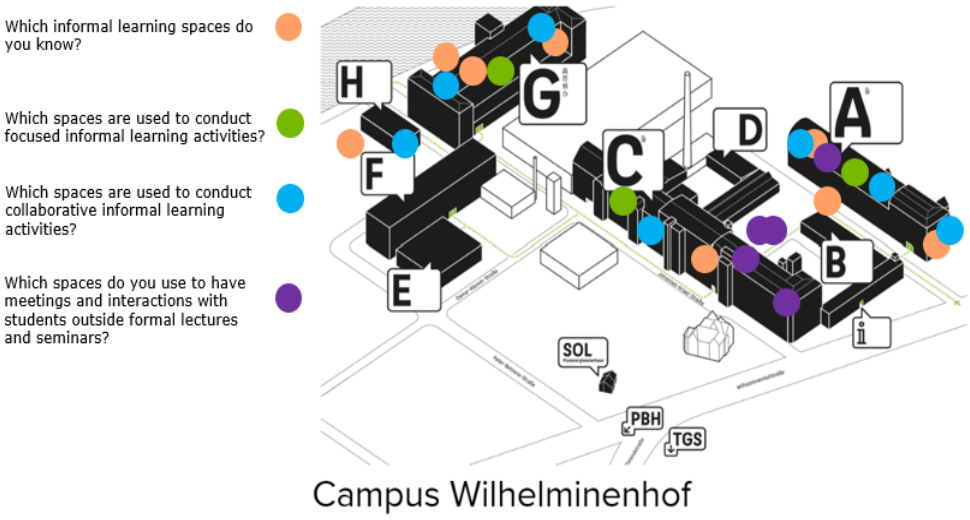

Figure 12. HTW campus WH map of informal learning spaces known and used by lecturers (adapted, based on focus groups with lecturers, 2022).

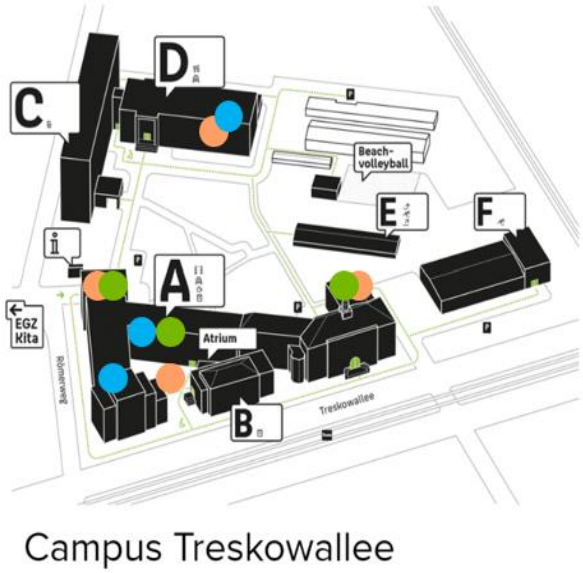

Figure 13. HTW campus TA map of informal learning spaces known and used by lecturers (adapted, based on focus groups with lecturers, 2022).

Accordingly, Table 15 lists the ILS that are frequently used by students identified by the lecturers interviewed.

Campus/ Building	Label	Indoor	Outdoor	Focused Learning	Collaborative Learning	Meetings/ Interactions	Reference
WH A (1st, 2nd, 3rd floor)	Seminar rooms	x		x	x		cf. L1, 2022, ln. 152, ln. 162.
WH A	Foyer	x		x	x		cf. L1, 2022, ln. 128-129, ln. 131-133, ln. 163-164.
WH A (every floor)	Hallway seating areas	x		x	x	x	cf. L1, 2022, ln. 203-205, ln. 214, ln. 217-219.
WH AB	Outdoor-yard		x	x	x		cf. L1, 2022, ln. 123-124.
WH AC	Passage near coffee bike		x			x	cf. L2, 2022, ln. 173-178; cf. L1, 2022, ln. 183-184.
WH C	Offices					x	cf. L2, 2022, ln. 172-173; cf. L4, 2022, ln. 196.
WH C	Seminar rooms	x		x	x		cf. L2, 2022, ln. 150-151, ln. 154, ln. 160-161.
WH C (i.e. 5th floor)	Hallway seating areas	x			x	x	cf. L2, 2022, ln. 134-137; cf. L4, 2022, ln. 196-202.

WH H	Urban garden		x	x	x		cf. L1, 2022, ln. 121-123.
WH H006	Makerspace	x			x		cf. L1, 2022, ln. 168-169, ln. 191-192.
WH G	Lockers in front of the library	x			x		cf. L4, 2022, ln. 227-230.
WH G	Canteen	x		x	x		cf. L2, 2022, ln. 125, ln. 231-232.
WH G	Beach		x	x	x		cf. L4, 2022, ln. 116-120.
TA A	Outdoor-yard		x	x	x		cf. L3, 2022, ln. 110-113.
TA A	Seating islands	x		x	x		cf. L3, 2022, ln. 248-250, ln. 256.
TA A	Seminar rooms	x		x	x		cf. L3, 2022, ln. 221-223.
TA A1 and A2, TA D	Library – reading hall	x		x			cf. L3, 2022, ln. 140-143, ln. 147-148.
TA D	Canteen	x		x	x		cf. L3, 2022, ln. 127, ln. 233.

Table 15. Important informal learning spaces at HTW Berlin as identified by lecturers (self-created, based on focus groups with lecturers, 2022).

Table 15 shows that lecturers identified solely the library at campus TA as ILS for **focused learning activities** (cf. L3, 2022, ln. 140-143, ln. 147-148).

In turn, only the hallway seating areas in the fifth floor of building WH C, the maker space H006 and lockers in front of the library at campus WH were identified as ILS used for **collaborative learning activities** only (cf. L2, 2022, ln. 134-137; cf. L4, 2022, ln. 196-202; cf. L1, 2022, ln. 168-169, ln. 191-192; cf. L4, 2022, ln. 227-230).

In addition, spaces used for **informal interactions** between lecturers and students are offices, hallway seating areas in the A and C building as well as outdoor spaces near the coffee bike at campus WH (cf. L2, 2022, ln. 172-173; cf. L4, 2022, ln. 196; cf. L1, 2022, ln. 203-205, ln. 214, ln. 217-219; cf. L2, 2022, ln. 134-137; cf. L4, 2022, ln. 196-202; cf. L2, 2022, ln. 173-178; cf. L1, 2022, ln. 183-184). However, particularly HTW-external lecturers claimed to face **difficulties** to **find appropriate ILS** that can be used **for informal interactions** (cf. L4, 2022, ln. 536-547). Accordingly, some lecturers seem to avoid this situation by meeting students in the digital space (cf. L3, 2022, ln. 548-549).

The majority of ILS on both campuses were identified for **both, focused and collaborative informal learning activities** by lecturers. Those spaces are for instance **indoor** spaces, such as:

- seminar rooms at WH (cf. L1, 2022, ln. 152, ln. 162, cf. L2, 2022, ln. 150-151, ln. 154, ln. 160-161) and TA (cf. L3, 2022, ln. 221-223),
- the foyer at WH A (cf. L1, 2022, ln. 128-129, ln. 131-133, ln. 163-164),
- hallway seating areas at WH (cf. L1, 2022, ln. 203-205, ln. 214, ln. 217-219) and seating islands at TA (cf. L3, 2022, ln. 248-250, ln. 256),
- the canteen at WH (cf. L2, 2022, ln. 125, ln231-232) and TA (cf. L3, 2022, ln. 127, ln. 233),

as well as **outdoor** spaces, such as:

- the outdoor yard at WH and TA (cf. L1, 2022, ln. 123-124; cf. L3, 2022, ln. 110-113)
- the urban garden (cf. L1, 2022, ln. 121-123) and
- the beach at WH (cf. L4, 2022, ln. 116-120) at WH.

Please find photos of the identified ILS in Appendix B.

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

Although the lecturers interviewed could identify several ILS on both campuses (as listed in Table 15), one lecturer claimed that **"we need more of everything, we have too little of everything"** (transl. L2, 2022, ln. 241-242), indicating inequalities concerning the **availability** of ILS at HTW Berlin, which are further analyzed in detail.

a) Differences among faculties

It was claimed that despite great potential, the campus generally lacks **appropriate** spaces for focused and collaborative informal learning activities (indoor and) outdoor). Large inequalities concerning the availability of those spaces exist particularly among faculties (i.e., faculty 2, in building C, versus faculty 5, in building A at WH), according to lecturers (cf. L2, 2022, ln. 241-243, ln. 245; cf. L1, 2022, ln. 246-247). Here, the emphasis is on **appropriate** ILS, whereof lecturers of faculty 2 **could not name a single good practice example** in the faculty 2 building as opposed to faculty 5 (cf. L2, 2022, ln. 262; cf. L4, 2022, ln. 266, ln. 515-520; cf. L1, 2022, ln. 505-507).

b) Infrastructure and ambience

Barriers that withhold existing spaces on campus from being defined appropriate ILS for students are predominantly limited to **infrastructural reasons** and resulting **lacking ambience**, as caused by being **badly soundproofed**, by **bad lightning or ventilation**, **lacking or outdated furniture and floors indoors**, as well as **restricted WIFI connection outdoors** (cf. L2, 2022, ln. 262-265; cf. L4, 2022, ln. 267-277).

Enhancing ILS technologically so that they meet certain SWFOs' needs seemed less of a concern as cases like these should be viewed as special situations and managed individually (i.e., students with financial barriers, who cannot afford a computer for studies), according to the lecturers interviewed (cf. L2, 2022, ln. 417-418).

Thus, it is assumed that there is "rather room for improvement" (transl. L4, 2022, ln. 275-276) concerning the appropriateness of infrastructure, as its resulting **lack of ambience** currently **affects the users' well-being negatively** (cf. L2, 2022, ln. 265).

2.2. Accessibility of informal learning spaces

Accordingly, **barriers to access** ILS on campuses were discussed with lecturers, whereas barriers concerning restricted physical access (i.e. in terms of freedom of barriers on campus) were not thematized as problematic from the lecturers' perspective as university campuses must be barrier-free based on the applicable building law in Germany (cf. L2, 2022, ln. 439). Lecturers reported most **seminar rooms** to be **predominantly unoccupied** during the day and solely occasionally occupied due to lectures and seminars held on site. Thus, lecturers view seminar rooms as **easily accessible** to students and seemingly do not view students applying trial and error methods to find ILS as somewhat difficult (cf. L2, 2022, ln. 320-326, ln. 328).

Additionally, the restricted **opening hours** of the canteen and library were **not** viewed as **problematic**. Despite **certain times** during the **day** (i.e., break times concerning the canteen) or certain times during the **semester** (exam period concerning the library) where these spaces can get very **crowded**, lecturers believe that those spaces are largely easily accessible and available for use (cf. L4, 2022, ln. 329-335; cf. L3, 2022, ln. 336-340).

However, lecturers identified the following **barriers to access** ILS on campus:

a) Registration and controlled access

Here, lecturers mentioned that students need to **register in advance** before using the **library's carrels** for focused learning activities as well as for its **group work rooms** at WH, whereas spaces for collaborative learning activities were for not accessible at all for a long time due to pandemic regulations (cf. L4, 2022, ln. 290-292; cf. L3, 2022, ln.293-296). Apart from that, lecturers seemed to be **little informed** about the formal regulations for students concerning accessing certain ILS and could only share their observations (cf. L2, 2022, ln. 297-303; cf. L4, 2022, ln. 304).

In addition, it became apparent that lecturers generally do not recommend ILS for focused or collaborative learning where students can go to prepare for the lecture, before and after lecture time (cf. L2, 2022, ln. 725-726; cf. L1, 2022, ln. 732-735). In specific cases students can get a **key authorisation** to **access certain rooms temporary** for informal learning activities (cf. L1, 2022, ln. 171, ln. 744-749). However, this seems to faculty and lecturer dependent and appeared to be rather sophisticated and uncommon for most lecturers interviewed (cf. L1, 2022, ln. 749-750, ln. 753-757; L2, 2022, ln. 170, ln. 172, ln. 725-731).

b) Accessibility of the campus for SWFO

Whereas the accessibility of individual ILS was made less subject of discussion, lecturers emphasized the **location of the campus** (primarily WH), and thus, the **accessibility of the campus as a preconditioned barrier**, particularly for **SWFO** (cf. L1, 2022, ln. 360-367; ln. 369-372; cf. L3, 2022, ln. 373-374).

It was claimed that for instance SWFO, who **work next to studying**, have **restricted time resources** and seem to evaluate whether it is worth taking on the rather inconvenient way to

campus for informal learning activities (i.e. inconvenience in terms of limited connection to public transport, which is time-consuming) (cf. L1, 2022, ln. 360-367, ln. 369-372; cf. L3, 2022, ln. 373-374; cf. L2, 2022, ln. 375-376).

However, it was also mentioned that this barrier might not only be traced back to students having fewer opportunities, but also to the **individuals' organisational skills** and **preferences** to manage their day (cf. L2, 2022, ln. 376-379).

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

Whereas lecturers assume that students' knowledge and awareness of ILS (as bottom-oriented stakeholders) is little, it will be looked at **top-oriented stakeholders' awareness** (cf. L2, 2022, ln. 487-492).

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

Although lecturers have observed improvements concerning promoting ILS on campus (i.e., implementation of seating islands at TA), some lecturers believe that the university management is still investing too little into it as of the year 2022 (cf., L3, 2022, ln. 477-482; cf. L2, 2022, ln. 444-445). Accordingly, lecturers discussed two potential factors that impact the degree of awareness concerning this topic: **priorities** and **dedication** of the university management and lecturers.

Lecturers do not certainly know whether the university management is not aware concerning the lack of appropriate ILS on campus or whether **priorities might be set differently** as it might be also challenging to serve different needs all at once (cf. L2, 2022, ln. 445-446, ln. 467-476; cf. L1, 2022, ln. 459-460, ln. 463-466).

Whereas external lecturers claimed to not receive any information concerning the informal learning space concept of HTW, it was claimed that HTW-internal lecturers' awareness concerning the lack of appropriate ILS on campus depends on the lecturers' **dedication to their job** beyond solely teaching (cf., L4, 2022, ln. 521-523; cf. L2, 2022, ln. 446-449; cf. L1, 2022, ln. 450-456). Accordingly, it is believed that the same concept applies to people working in the university management (cf. L1, 2022, ln. 456-457, ln. 463-466).

3.2. Lecturers' plans to break these barriers

a) Creating urgency and self-initiative

The assumption, that the greater the university managements' and lecturers' dedication towards their job, the higher their awareness regarding the **urgency to promote ILS** on campus, seems to prove true when looking at faculty 5 at WH. The high dedication of faculty 5's lecturers and its dean of studies to promote ILS resulted in **initiatives to implement ILS within their faculty building** without great restraint. Although the budget has been limited and the imitators had to face **top-down resistance**, they succeeded their aim to implement their plans of action (cf. L1, 2022, ln. 500-513).

Accordingly, it is suggested that **pilot projects**, in terms of implementing exemplary informal learning spaces (indoor as well as outdoor), to test user acceptance and usage, and with that, increase **sensemaking** and **awareness** to promote ILS on campus (cf. S2, 2022, ln. 764-769).

It seems that there are certain faculties and lecturers who are aware of existing barriers and who campaign for promoting ILS on campus. Here, lecturers seem trying to convey the **urgency** of expressing **appreciation** of students on behalf of the university **by providing appropriate ILS on campus.** Here, it seems essential to emphasize that **promoting ILS** can be viewed as a tool to **enhance the campus', and thus, university's competitiveness** (cf. L2, 2022, ln. 467-476; cf. L1, 2022, ln. 450-460; cf. L1, 2022, ln. 556-563).

b) Increase a sense of community

It has been observed that **students' identification** with the campus seems to be low, while identification can only be created "if you have a campus that is cool, if you have cool offers, and by *cool* I mean **ambient**" (transl. L1, 2022, ln. 675-676), according to one lecturer. Thus, lecturers believe it is essential to make ILS more **centralized** and **visible** on campus (such as the seating islands in the central hallways at TA building A) and realize the untapped campus' potential (cf. L2, 2022, ln. 691-698; cf. L3, 2022, ln. 761; cf. L4, 2022, ln. 771-781). At this, it is urgently needed to **increase offers** for informal learning activities, for instance in terms of providing **more creative spaces** on campus, where students can "**be themselves**" (transl. L4, 2022, 708-709) without lecturer supervision (L4, 2022, 699-710; cf. L1, 2022, ln. 714-718). Keeping in mind different disciplines, it was also supposed to **extend** the informal learning space environment and **create adventure and experimental spaces** beyond the campus (in terms of excursions or facilities free to use off-campus) to create a **sense of community** and attract students back to the physical (campus) in the first place (cf. L1, 2022, ln. 659-666, ln. 683-690).

4. Hybrid and virtual learning activities

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

Lecturers believe that HTW Berlin already provides a range of **university-owned services** in the virtual space, which have **"hardly been used"** (transl. L2, 2022, ln. 644-645) by students. It was also discussed how online platforms could enhance collaborative hybrid groupwork, in terms of connecting students studying on campus with those studying from home with login via QR-codes in seminar rooms. However, it was claimed that, from experience, students are even **put off by** virtual services as soon they carry the university's logo (cf. L1, 2022, ln. 666-673, ln. 619-622; cf. L2, 2022, ln. 623).

Accordingly, it has been observed that students predominantly use **existing third-party-provided tools** (i.e., WhatsApp) to communicate with each other on distance, which appear to **outcompete** university-provided services (cf. L1, 2022, ln. 613-617).

In view of the **low demand** for university-provided virtual services on behalf of students, it is suggested to maintain good maintenance of existing digital services (such as Moodle) but to stop investing in further merely virtual services (cf. L2, 2022, ln. 640-658). In turn, it is proposed to invest in **making the physical campus attractive** to attract students back to campus (cf. L2, 2022, ln. 652-653.).

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

Lecturers have observed **students feeling lost**, having challenges orienting themselves and having **little knowledge** concerning the **location of specific amenities** on campus (cf. L4, 2022, ln. 594-598; cf. L3, 2022, ln. 599-603). To increase students' and lecturers' knowledge and help finding them existing ILS, including their main amenities (i.e., places to conduct group- vs. focused learning activities, accessibility of gastronomic offers, etc.) on both campuses, lecturers suggest to develop a **digital interactive campus map** (cf. L2, 2022, ln. 577-588; cf. L3, 2022, ln. 589-591).

In addition, it was mentioned that it could be helpful to simultaneously **integrate a room booking option** to the interactive mapping platform, which can be either accessible through the university's website or through a separate app (cf. L3, 2022, ln. 592-593; cf. L2, 2022, ln. 586-588).

Conclusion qualitative data analysis

Comparing the results of the focus groups with students versus with lecturers, the following conclusions concerning most important issues, concerns and challenges within the investigated themes can be drawn:

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

A fair number of informal learning spaces on both campuses could be identified during the student (11 ILS identified) and lecturer focus groups (18 ILS identified), indicating slightly higher knowledge of existing ILS on campus on behalf of the lecturers. Here, students and lecturers could predominantly name places belonging to their "own" campus, depending on where their faculty (building) is located, which indicates little knowledge-sharing concerning the availability and usage of ILS across campuses or even across faculties.

Less complaints were addressed concerning the actual number of ILS on campus, whereas the number of ILS that are appropriate were thematized in both focus groups. At this, both groups view great potential to implement appropriate ILS on campuses, whereas its current untapped potential was highly criticised.

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**

Both focus groups addressed current ILS' lack of appropriate infrastructure and ambience. It was claimed that there must be a fit between both factors, as good ambience alone without the necessary infrastructure and vice versa does not support informal learning activities, whereas those factors are essential to increase well-being and attract users back to campus. Certain barriers were weighted unevenly between the student and lecturer focus groups, indicating different user perspectives, such as:

The lacking overview concerning which ILS are at what time accessible and available to use for informal learning, seems to affect students more severely. Information on the availability and accessibility ILS are treated as insider knowledge instead of common knowledge, which is why students highly demand an overview of ILS, including a user-friendlier room-booking system that provides transparency, particularly when using seminar rooms for informal learning. In turn, lecturers view trial and error approaches and students moving to other rooms in case formal lectures are scheduled, as less problematic. Unknowingly, this lack of organization might feel less appreciative and welcoming to students and does not meet the basic needs of feeling autonomous, competent and related to the campus.

The restricted opening hours of the canteen and library were increasingly thematized by students as opposed to lecturers. Claiming ILS to be "places that students use independently and self-organized […]" (NIILS Project, 2022), restricted opening hours of certain ILS seem to constrain students in their impendency and self-organization to choose those.

ILS with lacking technological infrastructure, seemed to be a much of greater concern to students as compared to lecturers. Accordingly, students demand technologically enhanced ILS, in terms of sufficient availability of plugs and access to technological equipment, such as computers, for focused and collaborative learning activities highly.

Whereas lecturers believe the campus' location to be one of the largest barriers for students to access and use ILS on campus, the students interviewed revealed that geographical barriers are indeed a barrier for SWFO, yet, that even students without fewer opportunities who live nearby the campus, prefer to study from home. This indicates that students rather question in general whether the campus is attractive enough to be worth spending time on.

According to this, it seems that students and lecturers agree that campus attractiveness comes with an availability of diverse ILS that are easily accessible. Upon exploring multiple perspectives, it seems that both stakeholders currently view **administrative barriers as the most predominant ones in view of promoting ILS on campus**. Thereby administrative barriers for instance comprise the lack of information about ILS on campus as well as that there are no options to book or find ILS. Thus, students often do not know when they can learn at which places and which places are suitable and available for the variety of informal learning activities. Limited opening hours, the limited technical infrastructure, or that formal places (such as seminar rooms) cannot always be used as ILS since they are closed off, can also be considered as administrative barriers.

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

The participants of both focus groups assume that the university management and lecturers are aware of the lack of appropriate ILS on campus, given recent isolated implementations of ILS on campuses. However, it is assumed that priorities are not yet clearly set on promoting ILS on campuses since precise strategies remain unconveyed on behalf of the university management.

Students' and lecturers' ideas and plans to mitigate barriers predominantly address the need to improve the infrastructure, and with that, the ambience of existing ILS on campus to enhance the well-being of users. As to that, it is essential to enhance ILS technologically and to establish more (collaborative) creative spaces.

Given the fact that information on ILS is currently treated merely as insider knowledge, the interviewed students and lecturers both addressed the need to market ILS on campuses and make information on availability and accessibility of ILS visible and accessible to everyone.

It was addressed repeatedly that good availability, accessibility and visibility of ILS increase the campus' attractiveness, and with that, its competitiveness, indicating profound reasons to justify sensemaking and the urgency to promote ILS on campus.

4. Hybrid and virtual learning activities

The students and lecturers interviewed both agreed that no additional university-provided digital services for communication in the virtual space are demanded since third-party provided tools are likely to continue outcompeting them.

Given the lack of transparency concerning ILS on campuses of HTW Berlin, participants of the student and lecturer focus groups expressed a high demand for an interactive mapping platform, depicting the university's existing ILS including information on availability and accessibility of corresponding amenities. Integrating room-booking options to this digital platform have been discussed by both parties, while it is believed in investing in a digital platform that supports students on the physical campus.

Summary: Key findings regarding user's perspective

Whereas the quantitative results show ILS to be a relevant factor for increasing belongingness, interpersonal relationships, well-being and university campus satisfaction, the student and lecturer focus groups reveal that administrative barriers restrain students' possibility to use ILS on campuses at HTW Berlin. Those administrative barriers lead to lacking availability and accessibility of appropriate and diverse ILS on both campuses. Whereas students and lecturers believe there is great untapped potential, it is urgently suggested to realize the qualitative implications and mitigate administrative barriers by improving existing ILS in terms of (technological) equipment and basic needs (i.e., sound absorption, privacy, comfort,

gastronomic offers, etc.), enhancing opening hours and transparency concerning prevailing rules of use, as well as offering more diverse (collaborative) creative spaces on campus. Additionally, it is urgently needed to increase the visibility of ILS on campuses, whereas information on the availability and accessibility of ILS on campus must be made transparent and accessible to everyone to switch insider knowledge on ILS to common knowledge. Increasing the offer and access of ILS on campuses, and with that, improving the campuses' quality, will support integrating students more and support increasing interactions between students, which in turn, will lead to a higher satisfaction and well-being, as shown in the quantitative results of this study.

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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

Donau-Universität – Krems

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

Appendix B – Focus groups/interviews

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 **Map and Photos at MURAL-Board**	**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 ➢ 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?
e) Students' and lecturers' **awareness and enabling strategies** to deal with	**Awareness and existing strategies to decrease inequalities (15 min)** ➢ What do you think: Are your lecturers and the university administration know these barriers?

existing inequalities and 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 <u>you</u> 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	**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?

environments conducive to learning and well-being PPT: List of categories for fewer opportunities	➢ Are there any obstacles regarding the availability of informal learning places? ○ Examples: not enough places, too crowded, environmental factors (light, temperature, 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	**Definition Hybrid Activities:** combining activities with regard to space (physical and virtual spaces) and time (synchronous and asynchronous activities; see Reinmann, 2021, S. 4)

PPT: List of in-depth-questions	*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):

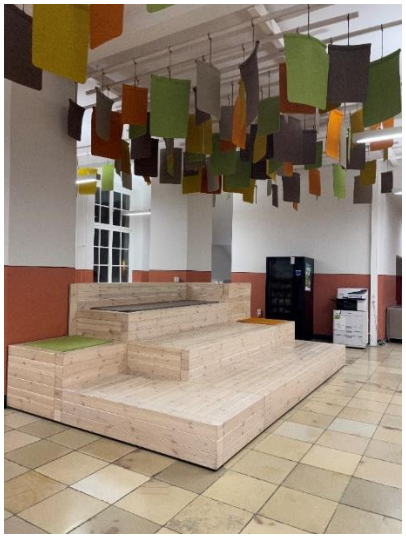
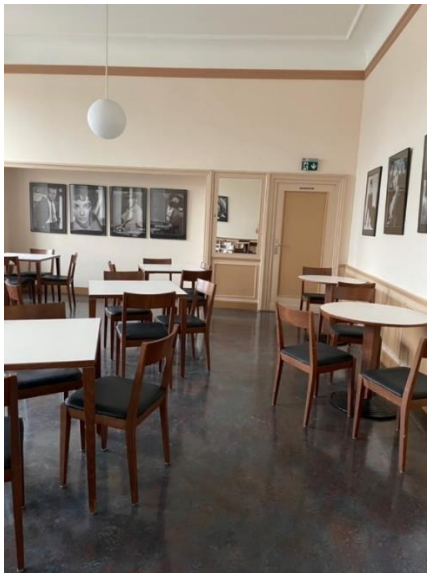
Codes	**Subcodes**
Informal Learning Spaces on Campus	Focused Informal Learning Spaces
	Collaborative Informal Learning Spaces
	Informal Learning Spaces Used for Meetings
	Satisfaction
Barriers to Access	Opening Hours
	Registration/Controlled Access
	Physical Barriers
Barriers to Availability	Limited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

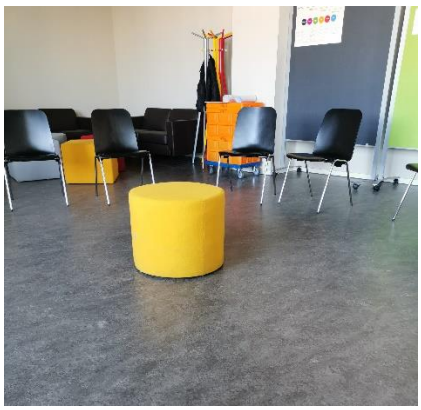
Photos of informal learning spaces

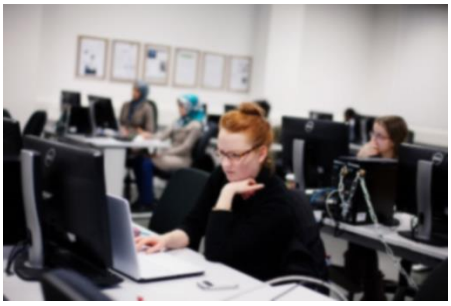
ILS identified in student focus groups

Unless otherwise indicated, photos were taken as part of the NIILS project.

Labels	**Photos of ILS**
Seminar rooms (TA A)	
Library (TA A)	
Outdoor yard (TA A)	

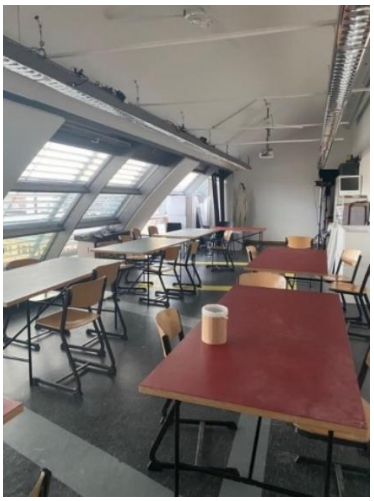
Seating islands (TA A)	
Hallway seating (TA A)	
Canteen (TA D)	

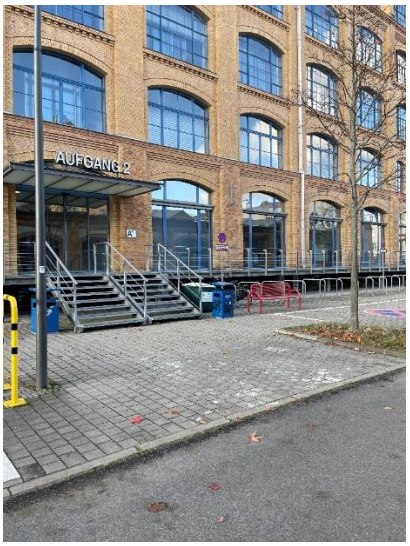
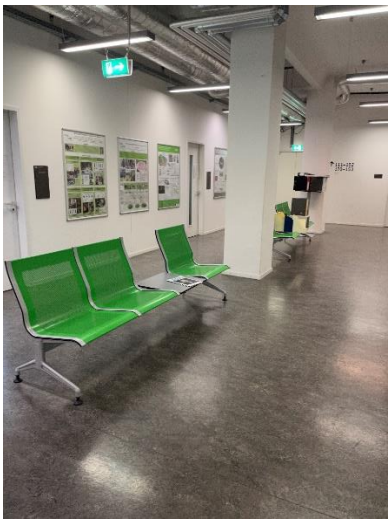
Outdoor-canteen (TA D)	
Park (TA 0)	
Creative Space (WHC 452)	

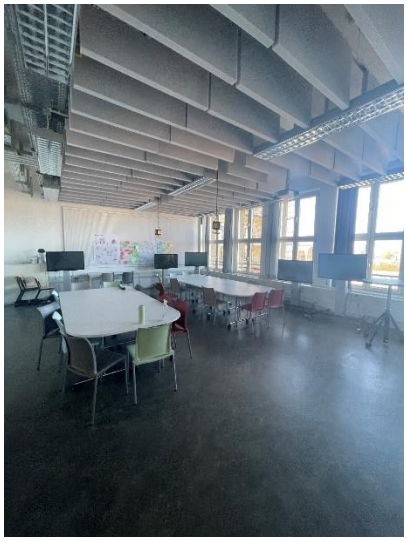
Beach (WH D)	
Laboratories (WH D007)	 Source: https://www.f4.htw-berlin.de/labore/

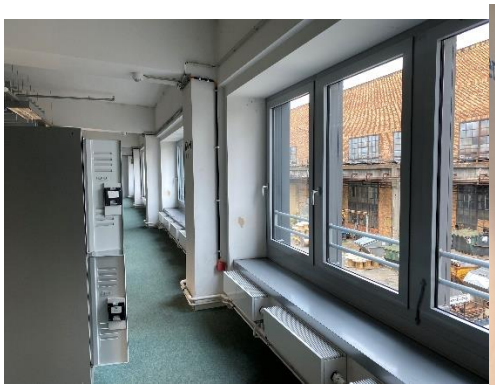
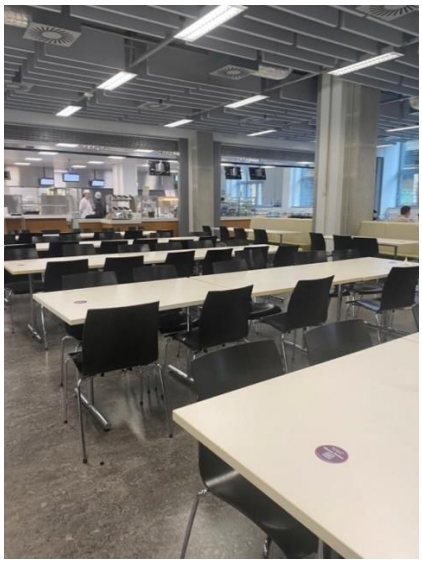
ILS identified in lecturer focus groups

Unless otherwise indicated, photos were taken as part of the NIILS project.

Label	Photos of ILS
Seminar rooms (WH A 1st, 2nd, 3rd floor)	
Foyer (WH A)	
Hallway seating areas (WH A, every floor)	

Outdoor yard (WH AB)	
Passage near coffee bike (WH AC)	
Offices (WH C)	

Seminar rooms (WH C)	
Hallway seating areas (WH C, 5th floor)	
Urban Garden (WH H)	

Maker Space (WH H006)	 Source: https://es-la.facebook.com/htwstartup/
Lockers in front of the library (WH G)	 
Canteen (WH G)	

Beach (WH G)	
Outdoor-yard (TA A)	
Seating islands (TA A)	

Seminar rooms (TA A)	
Library reading hall (TA)	
Canteen (TA D)