

# **Library café or elsewhere: Usage of study space by different majors under contemporary technological environment**

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## **Abstract**

**Purpose:** As current university students may access information for their study anytime, anywhere with ubiquitous mobile technologies, this research re-examines the roles of study space in students' learning and campus life.

**Methodology:** A survey was conducted to collect students' opinions and habits regarding the usage of different study spaces. Results in three different academic majors (Science and Engineering, Arts, and Business) of a comprehensive international university were compared.

**Findings:** Our findings showed a more diversified space usage among students, with the library café increasingly important in students' learning and life while learning commons remain important. However, there were only minor differences among these three study majors towards the learning and entertaining spaces, as these students generally apply inquiry-based learning.

**Originality/value:** While some researches have investigated students' usage of university and library learning spaces, few studies have focused on the study space issue in Hong Kong or other metropolises in the East under the current mobile learning environment. This study's insights could help libraries and universities improve the management of their physical spaces to meet student needs.

**Keyword:** academic libraries; study space; library cafes; collaborative learning; learning commons; quantitative method; Hong Kong

## **Introduction**

In recent years, the use of mobile devices for mobile learning has proliferated (Lau et al., 2017). Since students become adapted to retrieve library resources anytime, anywhere, physical access to library materials seems less critical (Pierard & Bordeianu, 2016). To attract more physical visits, university libraries have made different changes, such as permitting food and drink, allowing conversation (Seal, 2015), increasing their presence in social media (Fong et al., 2020; Lam et al., 2019), and renovating the physical learning spaces. The renovation of physical learning spaces in libraries may include replacing bookshelves with the newly designed areas for multipurpose function, such as the library lounge, individual study room, meeting room, and break-out space relaxation social gathering (Mark & Marcus, 2013). While libraries have provided a wide variety of learning spaces for different study needs of today's learners, informal learnings and group discussions have become popular in learning commons and cafes (Cunningham & Walton, 2016), where collaborative learning among peers may be more effective and creative (Jon, 2009).

Although some studies have investigated students' usage of learning spaces, few have focused on the study space issue in Hong Kong or other metropolises in the East, especially under the current ubiquitous Internet environment of the global knowledge economy. As Hong Kong is well known for its high-density population, students may prefer studying on campus to crowded dormitories or apartments. As even the university campus has limited space, study spaces are scattered in different parts of the university, and students may also choose study spaces outside the campus (such as restaurants and cafés near campus). Thus, we further explore students' overall study space preferences, which is missing from the literature.

Although another earlier study (Deng et al., 2017) has compared the library café usage of three university libraries in Hong Kong, Tokyo, and Kentucky, scant studies focus on how students' educational background may affect their space usage preferences, mainly depending on individuals' requirements and preferences (Asher, 2017; Mangrum & Foster, 2020). So, this research explores how learning spaces contribute to students' learning life by comparing the preferences among three faculties in the university. Our findings provide hints for library improvements to attract more users and increase the usage of library services and facilities. Therefore, we set out our study with the following research questions.

RQ1: What are the roles of various physical spaces in university students' learning and campus life?

RQ2: What are the similarities and differences among students of different majors towards the physical spaces inside and outside the university campus?

RQ3: What insights can we learn from this study for the library to attract more visits?

## **Literature review**

### ***More than a library—role shift from a repository to educational and social places***

As traditional libraries were designed as book storage to collect, display, and preserve collections, the library is similar to an information and intelligence warehouse, where users circulate materials and acquire the desired

knowledge (Morell, 2004). However, nowadays, as library strategies are moving beyond library collection management, it has become more than just a repository (Fallin, 2016). With the rapid growth of electronic resources available through the Internet, scholars and students can search for relevant information remotely on their mobile devices. This trend has transformed the library into a new venue with fewer printed materials circulations but more requests on the social and educational patterns of learning, teaching, and research support (Pierard & Bordeianu, 2016; Wang et al., 2016).

Many university libraries worldwide consider ways of improving library learning spaces to cater to actual user needs. For example, the University of Tsukuba conducted a nationwide survey to evaluate the new learning space at the academic libraries in Japan (Donkai et al., 2011), mostly with a relatively conservative approach, offering few computers and beverages vending machines. Freeman (2005) noted that many libraries are re-designed for collaborative study, eat, drink, and chat. For example, Bryant et al. (2009) employed an ethnographic method to explore the roles of open space in the Loughborough University Library and found that both collaborative and individual study space have their importance for different student needs, particularly, an open library space has become fashionable by providing a less intensive atmosphere for students to conduct group learning, allowing social interactions, and encouraging users to settle down and stay for prolonged periods. Donkai et al. (2011) reported that new learning spaces called “learning commons,” providing library services and learning resources in one place, are becoming popular. Allison et al. (2019) shared similar findings that the opening of the new learning commons has significantly increased the library visits. The development of IT technologies has also provided new opportunities for library transformation. Multimedia equipment and various type of software become available in the library (Huang & Wang, 2021). Makerspaces are also established in some libraries or learning commons to allow users to create objects with new technologies such as 3D printing (Altman, 2015; Cao et al., 2020). While librarians are planning to implement learning commons in their libraries, different aspects of the space planning, such as the size of printed collection, integration with new technologies and proportion of quiet study and collaborative space are needed to consider to satisfy the changing demands of patrons (Blummer & Kenton, 2017; DeFrain & Hong, 2020; Huang & Wang, 2021; Pierard & Bordeianu, 2016).

### ***Library as the “third place”—integrated with café***

The term “third place” refers to the place we go after work and before home, and Oldenburg (1997) pointed out that third places are those informal public gathering places. Therefore, libraries readily offer services of study, passions of discovery, and socialization opportunities, which constitute the third-place (Harris, 2007). Moore (2006) suggested that libraries should be designed like cafés, bookstores, art galleries, and other cozy environments to remain the popular choice of third place. Moreover, many researchers have indicated that libraries should be much like retailers if they are seriously considered the third place (Harris, 2007).

However, some librarians have expressed concerns about introducing a café within the library, as most libraries traditionally forbade food and beverages for conservation and preservation. Even nowadays, most

libraries are not allowing users to bring in any of them because this may cause serious housekeeping problems, while spilled liquids and chunks of foods could be the potential risks of library materials (Abba, 2016). Some argued that libraries' primary role is to match the information needs and maximize library resource utilization for users instead of going commercial. Gayton (2008) asserted that a more socialized academic library could do more harm than good, and achieving a balance of opposing needs and functions in libraries is difficult, for example, quiet versus noisy, conservation versus food and drinks, and openness versus security (Demas & Scherer, 2002).

On the other hand, some studies have shared successful implementations of cafés within libraries. The case of Café Gelman indicated that a library with a café could complement the influence of remote usage, resulting in fewer interactions among scholars and students (Masters et al., 1994). Another advantage of having a library café is that users would stay longer (Calvert, 2017). Christchurch City Libraries was the first to integrate the café into the library in Australia and witnessed user experience improvements and longer library visits. Geraldton Public Library has also been successfully operating the café for a long time.

Interestingly, coffee has been considered a very successful way to increase library circulation, library facilities usage, and social activities in libraries (Harris, 2007). As reported in the Library Administrator's Digest, a library café is an excellent idea to attract users to have coffee while studying or working (Anonymous, 2014). Deng et al. (2017) suggested that the library café had great potential to promote informal learning. Librarians could learn from those cases or ideas by implementing more personalized policies, such as providing coffee services and more relaxed spaces, encouraging more people to use library facilities, and staying for a longer time.

### *Learning space preference*

Libraries generally provide different learning spaces to match student needs (Bennett, 2007), but students' preferences for learning spaces depend on many factors. Huddersfield University Library, which evaluated the impact of learning space on learning behavior and learner support, also found that students chose particular spaces for specific reasons (Ramsden, 2011).

More literature on learning spaces pointed out that the atmosphere generated in the spaces is influential. For example, Waxman et al. (2007) highlighted that the most popular places students would like to go are socialization and relaxation. Webb et al. (2008) noted that students at the University of Dayton (UD) use the library primarily because the learning environment could facilitate interpersonal communication. Garnar and Tonyan (2021) also pointed out that the unique atmosphere and aesthetic characteristics generated in the library are indispensable as students enjoyed its quiet and beautiful space.

On the other hand, the learning environment also plays an essential role in students' learning satisfaction. Many studies emphasized the importance of quiet and individual study space as a primary task for users' independent work (DeFrain & Hong, 2020; Hegde et al., 2018; Hillman et al., 2017). Fister (2009) suggested that students want good lighting, comfortable furniture, warm colors, and food access in the library, instead of

the high-tech or modernized space. Similarly, Li et al. (2018) reported that students prefer satisfactory lighting, a quiet environment, and convenient locations. Research conducted in the Sheffield Hallam University revealed that students' learning space preferences depend on the destination, conversation, community, retreat, timely, and human factors (Harrop & Turpin, 2013).

Besides, preferences towards learning space also differ with gender and time. In the study of Indiana University Purdue University Indianapolis, Applegate (2009) found that men are more likely to visit the library computer area than women, and the usage of different library spaces changed periodically. For example, the occupancy of the study carrels increased sharply during the end of the semester. The findings illustrated that library users care about the sound levels, lighting, food, drinks, resources accessibility, and opening hours. Only a more diversified on-campus design of spaces can satisfy both formal and informal learning. Thus, an in-depth study is currently required, as user needs preferences have changed much after adopting mobile technologies (Wang et al., 2016).

## **Methodology**

To evaluate students' preferences towards physical spaces, a comparative quantitative research method was used in this study. An online survey is a convenient way to collect the data for this study, since respondents may finish the survey individually without time or space limitations. To recruit an adequate number students, a survey was created using two online platforms, Google Forms and Sojump. Sojump was mainly used for those who were currently in mainland China, as Google is blocked there.

The survey questions were extended and adapted from our previous study (Deng et al., 2017) to find out students' preference of study spaces other than the library and library café. We added the first half of our study with many other locations to explore students' general preference of study space in the Hong Kong environment (e.g., home situations, hostels, restaurants, other places near campus, etc.). In the second part of our survey, we reuse questions in our previous studies to effectively compare the difference in study space preferences of students from different faculties in the subject university.

All the questions were simple and arranged logically so that the participants could feel comfortable answering (Bryman, 2015). The survey comprised three parts, demographic information, respondents' home environment, and their usage of various learning spaces. The first part aimed to obtain basic demographic information such as gender, major, study degree. The second part of the survey was used to gather information about students' opinions about their home environment, highlighting the roles of library café in student lives. Both closed-ended and open-ended questions were used in the third part of the survey to allow participants to express their opinions towards the learning space thoroughly. All participants were confirmed with their voluntary participation before answering the survey questions. This research was approved by the Human Research Ethics Committee of the Faculty of Education in the subject university.

The online survey was spread via popular social network channels, such as Facebook, WeChat, and WhatsApp. The survey was first sent to friends and classmates in Library and Information Studies (LIS)

program. Then, students from other faculties were approached to fill in the questionnaire through the student associations and clubs. A total number of 127 responses were collected. After discarding uncompleted responses, 117 responses were used for this study. For further analysis, the respondents were classified into three broader categories in terms of educational background: Business Students (BST, n=31), Science and Engineering Students (SEST, n=49), and Arts Students (AST, n=31), and six respondents were unable to classify. The data were analyzed using Excel and SPSS. Table 1 summarizes the demographic information of all respondents, with more than 97% of them under 30 years old and nearly 70% of them aged between 23 to 25.

**Table 1. Age of respondents**

Age	BST (Business Students) n=31		SEST (Science and Engineering Students) n=49		AST (Arts Students) n=31		Overall n=117	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
18-22	0	0.0%	6	12.2%	2	6.5%	9	7.7%
23-25	24	77.4%	33	67.3%	23	74.2%	81	69.2%
26-28	6	19.4%	8	16.3%	3	9.7%	19	16.2%
29-30	1	3.2%	2	4.1%	2	6.5%	5	4.3%
over 30	0	0.0%	0	0.0%	1	3.2%	3	2.6%

## Results and Analysis

### *Different space needs for different study purposes (RQ1)*

Due to the crowded housing situation in Hong Kong, the survey included a section about the home environment. Table 2 shows that over half of the respondents (53.8%) required only less than 20 minutes to get to the campus, and over 90% of them could arrive within one hour. Besides, their home size was small, with a majority 52.1%) between 25m<sup>2</sup> to 50m<sup>2</sup> and a considerable percentage under 25m<sup>2</sup> (see Table 3).

**Table 2. Distance from University to Home**

Estimated time to travel from home to campus	BST (n=31)	SEST (n=49)	AST (n=31)	Overall (n=117)
Less than 20 mins	51.6%	57.1%	51.6%	53.8%
Between 21 mins to 60 mins	41.9%	30.6%	41.9%	37.6%
Between 61 mins to 120 mins	6.5%	10.2%	0.0%	6.0%
More than 120 mins	0.0%	2.0%	6.5%	2.6%

**Table 3. Size of Home**

Size of your home	BST (n=31)	SEST (n=49)	AST (n=31)	Overall (n=117)
Below 25 m <sup>2</sup>	9	10	13	34 (29.1%)
25 m <sup>2</sup> to 50 m <sup>2</sup>	17	28	14	61 (52.1%)
51 m <sup>2</sup> to 80 m <sup>2</sup>	2	4	2	10 (8.5%)
over 80 m <sup>2</sup>	3	7	2	12 (10.3%)

Table 4 shows the respondents' opinions towards the home environment. In general, respondents agreed that it was noisy at home. In terms of relaxation at home, all three groups felt relaxed while at home. However, SEST had a significant difference compared with the other two groups towards the view that home was supportive of their study ( $p < 0.05$ ). Several respondents might cause this from SEST living in homes more than 80 m<sup>2</sup>, as they had private and comfortable home spaces. To summarize, the living condition in Hong Kong is crowded for most of the students, and the atmosphere at home is too noisy for them to focus on study. Therefore, they prefer to go to campus to study instead of at home.

**Table 4. Home Environment**

Home Environment	BST (n=31)	SEST (n=49)	AST (n=31)	Overall (n=117)	p-value
Do you agree that it is noisy at home?	3.55	3.14	2.94	3.20	0.426
Do you agree that you would feel relaxed when studying at home?	3.48	3.45	3.23	3.40	0.3306
Do you agree that your home environment is supportive of your learning and studying?	2.71	3.02	2.74	2.86	0.0484

Notes: (1) Scale: 1: Strongly disagree, 5: Strongly agree

Table 5 shows the preferred places for respondents' specific needs. Respondents considered the library as the most popular choice for formal learning, followed by a separate learning commons. The results changed a little when respondents were asked to choose the preferred place for group meetings or informal learning. For example, when respondents planned to have club meetings, both libraries (32%) or library cafés (32%) were considered their first preferred places. For the social and recreational activities, the responses totally differed from other activities. For example, 62% of the respondents preferred the library café for "*relaxing or taking a break between your studies.*"

**Table 5. Top 3 preferred places for specific needs**

Situation	1 <sup>st</sup> Choice	2 <sup>nd</sup> Choice	3 <sup>rd</sup> Choice
Study/prepare for tests/exams	A 54%	C 32%	E 6%
Work on assignments	A 38%	C 38%	B 15%
Read essays or other scholarly literature	A 45%	C 31%	B 14%
Long-time individual study /task	A 39%	C 33%	E 13%
Short-time individual study /task	A 36%	C 28%	B 21%
Medium-time individual study /task	A 43%	C 29%	B 15%
Give tutorials to students / mentees	A 34%	C 29%	B 25%
Receive tutorials from mentors / teachers	A 38%	B,C 26%	
Design/prepare a PowerPoint presentation	A 36%	C 34%	B 15%
Prepare for a job interview	E 32%	A 23%	C 22%
Collaborative learning/group discussions for assignments or research	A 38%	C 32%	B 24%
Group meeting for student clubs and associations	A,B 32%		C 26%
Recreational reading	B 38%	A,C 21%	
Relax or take a break between your studies	B 62%	C 13%	A 9%
Use online social networking tools	B 40%	E 25%	C 15%
Use the Internet for entertainment purposes	B 34%	E 26%	C 18%
Meet/hangout with classmates or friends	B 44%	G 17%	C 14%
Wait for someone	B 56%	A 15%	F 10%
Date with your girlfriend/boyfriend	B 40%	G 32%	C 10%

Note: A: library and other branch libraries; B: library café; C: separate learning commons; D: Hostel; E: Home; F: Other places near campus; G: Other places outside the campus and home not near to campus.

**Table 6. Top 3 Choices for Specific Needs among three student groups**

Situation	BST n=31			SEST n=49			AST n=31		
study/prepare for tests/exams	A 48%	C 42%	E 10%	A 57%	C 24%	D 24%	A 58%	C 29%	D 6%
work on assignments	C 45%	B 23%	A 19%	A 47%	C 27%	D 27%	A 45%	C 42%	B,D,E,F 3%
read essays or other scholarly literature	C 48%	A 35%	B 10%	A 51%	B 22%	C,D 18%	A 55%	C 26%	B,D,E,F,G 3%
long-time individual study /task	C 48%	A 26%	B,E 13%	A 41%	C 27%	D 27%	A 52%	C 29%	E 10%
short-time individual study /task	C 42%	A 26%	B 19%	A 39%	B 24%	C 20%	A 45%	C 26%	B 16%
medium-time individual study /task	C 45%	A 35%	B 16%	A 39%	B,C,D 20%		A 58%	C 23%	E 10%
Give tutorials to students / mentees	C 38%	A 35%	B 23%	B 33%	A 33%	C 20%	A 39%	C 26%	B 16%
Receive tutorials from mentors / teachers	A 42%	C 35%	B 23%	B 33%	A 31%	C 20%	A 48%	B 23%	C 16%
design/prepare a PowerPoint presentation	C 45%	A 23%	B 19%	A 39%	C 31%	D 31%	A 45%	C 26%	E,B 13%
prepare for a job interview	E 39%	B 26%	A 16%	A 31%	C 24%	D 24%	E 42%	C 26%	A 19%
collaborative learning/group discussions for assignments or research	C 42%	A,B 29%		A 47%	B 24%	C 20%	C 39%	A 35%	B 16%
group meeting for student clubs and associations	B 39%	C 32%	A 26%	A 45%	C 24%	D 24%	B 35%	A, C 26%	
recreational reading	B 55%	C 26%	E 13%	A 29%	B 27%	C 18%	B 39%	A 23%	E 19%
relax or take a break between your studies	B 71%	C 19%	G 4%	B 63%	A 10%	C,D 8%	B 48%	C 16%	A 13%
use online social network	B 58%	E 19%	C 16%	B 35%	E 27%	C,D 16%	B 35%	E 29%	A 19%
use the Internet for entertainment purposes	B 55%	C 19%	E 16%	B 33%	E 31%	A 14%	E 29%	A 23%	B,C 19%
meet/hangout with classmates or friends	B 55%	G 15%	C 13%	B 43%	G 20%	A 12%	B 39%	A 16%	A,F 13%
wait for someone	B 77%	A,C,F 6%		B 55%	A 18%	F 10%	B 45%	A 19%	F 13%
date with your girlfriend/boyfriend	B 58%	G 35%	C 10%	G 35%	B 33%	A 14%	B 35%	G 32%	F 13%

Notes: (1) A: Library and other branch libraries; B: Library café; C: Separate learning commons; D: Hostel; E: Home; F: Other places near campus; G: Other places outside the campus and home not near to campus.

Table 6 presents the popular choices of respondents from three different majors. All these three groups indicated that they prefer to go to the library and learning commons when they needed to prepare for exams, read essays, or work on assignments. However, there were slight differences in informal learning. For example, 39% of BST and 35% of AST chose the library café for group meetings, while 45% of SEST chose the library instead. Similarly, 55% of BST and 39% of AST respondents preferred to read recreational newspapers or magazines in the library café, but only 27% of SEST respondents chose to do so.

### ***Using the library café for students from different faculties (RQ2)***

Table 7 shows the suitability of conducting specific activities in the library café of each group. The results indicated that the most suitable activities were related to socialization and recreation, such as relaxation and break (4.19), and wait for someone (4.15). Also, recreational reading (3.83) or group meeting (3.84) received a higher score when compared to formal learning, such as reading essays (3.01), working on assignments



(2.87). Apparently, the library café provides services and an environment that improves the user experience, while they conduct informal learning, but it seems to be too noisy when students have to concentrate.

**Table 7. Suitability of Conducting Specific Activities in Library Café**

Situation	BST (31)	SEST (49)	AST (31)	Overall (117)	P-value
Study/prepare for tests/exams	2.58	3.00	2.90	2.86	0.4674
Work on assignments	2.55	3.00	3.00	2.87	0.3111
Read essays or other scholarly literature	2.68	3.18	3.03	3.01	0.2101
Long-time individual study /task (more than 8 hours)	2.65	2.63	2.65	2.66	0.9915
Short-time individual study /task (less than 2 hours)	3.06	3.39	3.13	3.22	0.3354
Medium-time individual study /task (2-8 hours)	3.03	2.96	2.97	2.97	0.947
Give tutorials to students / mentees	3.03	3.37	3.23	3.24	0.3977
Receive tutorials from mentors / teachers	3.03	3.39	3.19	3.24	0.3746
Design/prepare a PowerPoint presentation	2.74	3.29	3.13	3.11	0.0872
Prepare for a job interview	2.68	2.92	2.90	2.86	0.5789
Collaborative learning/group discussions for Assignments or research	3.74	3.61	3.87	3.70	0.6471
Group meeting for student clubs and associations	3.87	3.80	4.00	3.84	0.6571
Recreational reading (e.g., newspapers, magazines)	3.87	3.73	3.97	3.83	0.8464
Relax or take a break between your studies	4.23	4.29	4.13	4.19	0.8667
Use online social networking tools (Facebook, Apps, WhatsApp, WeChat, Twitter)	4.06	4.02	4.13	4.03	0.8214
Use the Internet for entertainment purposes (e.g., Online games, watch TV drama or YouTube)	4.06	3.88	3.81	3.88	0.8596
Meet/hangout with classmates or friends	4.19	4.16	3.97	4.08	0.6548
Wait for someone	4.32	4.29	3.94	4.15	0.2236
Date with girlfriend/boyfriend	4.35	3.96	3.42	3.88	0.0362

Notes: Scale: 1: Least Suitable, 5: Most Suitable

Generally speaking, respondents from different majors shared similar opinions towards the suitability of activities in the library café. However, when selecting the preferred place for dating with friends, interestingly, BST respondents were more likely to meet friends in the library café, which was different from SEST and AST ( $p < 0.05$ ). Besides, most of them suggested that the library café was not the best choice for long-time study, assignment, exam preparation, which required a quiet environment, but it was more appropriate to conduct social activities.

Tables 8, 9, and 10 show the statistics about the atmosphere, factors attracting patrons to go there, and the improvement aspects of the library café, respectively. Most of the respondents claimed that the atmosphere in the library café was relaxing (70.9%), noisy (52.1%), and casual (44.4%). As for significant factors attracting them to go there, 68.4% of them selected the reason “*easy to have drinks and food*” and 65.0% “*freely talking.*” Moreover, over 40% of respondents indicated that the library should extend the business hours as most students study late at night, and there is no store open for them to eat. Besides, 44.4% of the respondents reflected that the library café should expand the space, considering the crowdedness inside the café and long queues for the drinks.

**Table 8. Atmosphere in the Library café**

Atmosphere	Count	Percentage
relaxing	83	70.9%
romantic	27	23.1%
quiet	14	12.0%

noisy	61	52.1%
casual	52	44.4%
free	35	29.9%
fashion	8	6.8%
other: allow discussion	1	0.9%
other: no feeling	1	0.9%

**Table 9. Aspects for Attracting the Users to Come to the Library Café**

Aspects attracting users	Count	Percentage
Easy to have drinks and snacks	80	68.4%
Comfortable chairs and desks (large sofa/outside seating)	36	30.8%
Less intensive environment	42	35.9%
Freely talking	76	65.0%
Lower prices for drink and foods	34	29.1%
Good temperature	25	21.4%
Fresh air (outside area)	15	12.8%
No idea	3	2.6%
other: delicious	1	0.9%

**Table 10. Aspects Need to be Improved**

Aspects of improvement	Count	Percentage
Extend the business hours	51	43.6%
More seats and power outlets/ bigger sofa/ outdoor seating	50	42.7%
Play good music	43	36.8%
Expand spaces	52	44.4%
Set workstations	26	22.2%
Lower prices for drink and foods	49	41.9%
Cooperation with the library to put some books on the shelves	47	40.2%
No idea	2	1.7%

Table 11 shows the importance of library café in respondents' study and life, and three groups expressed similar opinions. The question “*does the library café play an important role in your life*” scored 3.53, indicating that the library café was regarded as an essential place in students' life. Additionally, getting refreshments during the study (3.52) illustrated the need for having food and drinks among students. Also, respondents expressed that they were not happy to see the library café being replaced by other learning commons or vending machines.

**Table 11. The Importance of Library Café and Refreshments & Drinks in Study**

	BST n=31	SEST n=49	AST n=31	Overall n=117	p-value
Are you happy to see the University Library Starbucks being replaced by another Information Commons?	2.61	2.63	2.52	2.59	0.8541
Do you agree that vending machines could completely replace the University Library Café	2.52	2.02	2.26	2.23	0.1048
Does the University Library Cafe play an important role in your student life?	3.71	3.43	3.52	3.53	0.5988

Studying for exams or doing assignments, being able to eat snacks and drink refreshments- is it important to you?	3.65	3.33	3.71	3.52	0.3138
How would you rate the overall services, operations, setup, and atmosphere of the University Library Cafe?	3.94	3.86	3.77	3.85	0.658

Note: Scale: 1: Very unhappy, 5: Very happy; 1: Strongly disagree, 5: Strongly agree; 1: Not at all Important, 5: Very Important; 1: Very bad, 5: Very Good

As displayed in Tables 12 and 13, 69.2% of the respondents would occasionally go to the library café when they were in the library, and 23.9% of them asserted that they would go to the library café more frequently. Moreover, the three groups held similar views that the library café could attract more people to come to the library and stay longer in the library by providing refreshments and a comfortable atmosphere.

**Table 12. Frequency of Going to Library Café**

Frequency	Count	Percentage
Sometimes	81	69.2%
Most of the time	28	23.9%
No, I never	8	6.8%

**Table 13. Relations between Library and Library Café**

	BST n=31	SEST n=49	AST n=31	Overall n=117	p-value
Do you agree that the University Library Cafe has successfully attracted more people to use the University Library in person?	3.68	3.35	3.52	3.46	0.3288
Would you agree that the existing University Library Starbucks has led to patrons spending more time in the library?	3.58	3.27	3.48	3.40	0.2137

Note: Scale: 1: Strongly disagree, 5: Strongly agree

## Discussion

This study aims to examine the roles of learning space play in the students' life and the learning space preferences among students with different educational backgrounds under the current ubiquitous computing environment. This section discusses some insights for the library and university management (RQ3) according to our findings of RQ1 and RQ2.

### *Diversity of learning venues*

Notably, our findings indicated that traditional learning venues, such as the library and learning commons, were the most popular formal or informal learning places. In the survey, more than two-thirds of students would go to the library and learning commons for preparing for tests/exams, reading essays or literature, collaborative learning, and individual study (see Table 5). This may probably be because most of their primary task/assignment in the curriculum are individual-based (DeFrain & Hong, 2020). Due to the crowded housing situation in Hong Kong, the library provides quiet space for users to concentrate on their private studies and revisions.

The library café at this university is a part of the library building located at the central campus and acts conveniently as a social place for students to meet and chat. In line with Deng et al. (2019), the library café is getting more popular with better access to electronic and printed resources as well as better collaboration facilitation. Students who participated in this survey expressed that the relaxed atmosphere and being able to talk and discuss attracted them to go to the library café, which is similar to the findings of Jonathan and Andrew (2014) that the environment greatly influences their choice of locations. Usually, students in the library café enjoy the drinks and sofas while waiting for their friends, reading magazines, or just having a break during the long-time hard work. However, our findings indicated that the library café has gradually become a place for informal learning instead of only providing food and beverages for students. In this survey, a certain number of participants indicated that they prefer club meetings or group discussions (32%), and collaborative learning (24%) in the library café (see Table 6). In other words, the library café is not only a place for socialization but also a place for students to learn more freely and creatively in a less intensive environment. This is further facilitated with ubiquitous mobile connectivity (Dukic et al., 2015; Wai et al., 2018).

Learning commons become more favorable spaces for various learning and non-learning activities for participants from different faculties, especially many learning commons in this university open 24 hours (Chan et al., 2020). With ubiquitous access to library resources and increasing electronic resources (Wang et al., 2015), universities should create multiple types of learning spaces (e.g., deep quiet space, group discussion space, less intensive space) at different campus locations. Our finding suggested that more food and beverages supply to learning commons and other learning spaces likely benefit students similar to the library café. Further, our findings suggest re-designing some areas with comfortable sofas to meet students' recreational needs and casual reading. Given similar designs have been adopted and well-received in a comprehensive international university, librarians from other universities may also consider adopting a similar strategy.

### ***Learning space preferences of students with different majors***

Against previous assumptions, there was no clear line among science and engineering students, business students, and art students regarding their learning and recreational spaces. As discussed in the data analysis section, it seems that all of these three groups shared similar learning habits. Technological factors have less effect because of ubiquitous Internet connectivity. In terms of academic study, scholarly literature reading, and assignment working, students would like to go to the library and learning commons rather than library café, home, or hostel. Thus, students could concentrate on their studies and be encouraged by other hardworking students nearby.

For social activities, most students agreed that they prefer to go to the library café for meeting friends and informal group discussions, as the environment was more comfortable with food and drink service. Thus, the educational background was not a very strong factor influencing their choices even though students from different disciplines may need to work on different types of assignments and projects. Yet, under the current

trend of inquiry-based learning, such differences tend to reduce, as group work and creativity have been emphasized in the current globalized knowledge economy, especially in this comprehensive international university (Deng et al., 2019).

Yet, there were slight differences in space preferences among students from different majors. For art students, choosing the home is always in the top three places for formal or informal learning. The home is one of the most popular places for individual studies since it is more private. Such minor differences may be because of their learning habits, reading habits, special needs, and convenience (Wang et al., 2016, Wai et al., 2018).

Our findings may offer implications for other university librarians regarding various spaces in students' learning and campus life. Although most respondents prefer traditional places like the library and learning commons for easy access to computers and literature resources, our findings indicated more respondents chose the library café and learning commons for informal learning or group discussion purposes. Thus, the library should also consider providing reference services in major learning commons and the library café, along with online virtual reference services to cater to the increasing diversity of student learning venues and mobile learning anytime anywhere (Dukic et al., 2015, Wai et al., 2018).

## Conclusion

This study explores the roles of study space in students' learning and campus life at a university in Hong Kong. Our findings have indicated some minor differences in space preferences towards the learning and entertaining spaces among these three majors (Science and Engineering, Arts, and Business). The library café and learning commons could provide services and environments that traditional libraries could not achieve, such as a relaxed atmosphere and talking or discussing, which may bring a new user experience for students. More importantly, the findings suggested an increasing demand for conducting learning practices in a less intensive and relaxed environment over diverse venues, which may drive the university library to change and innovate its services (Wójcik, 2019). We shall continue conducting similar studies in other university libraries so that the library and university management are more informed about general student space usage to provide better services over the campus. University students in different countries will better enjoy the benefits of space flexibility for their daily learning lives under ubiquitous Internet availability.

Our continuing study is to further compare the space usage of the library and learning commons with a more theoretical framework of social capital, especially under the current COVID-19 pandemic (Leung et al., 2021). Besides, we are investigating makerspace usage (Maceli, 2019) in universities.

## Reference

- Abba, S. (2016). Snacks in the Stacks: Food and Drink in North American Libraries. *The iJournal: Graduate Student Journal of the Faculty of Information*, 2(1).
- Allison, D., DeFrain, E., Hitt, B. D., & Tyler, D. C. (2019). Academic library as learning space and as collection: A learning commons' effects on collections and related resources and services. *The Journal of Academic Librarianship*, 45(3), 305-314.
- Altman, M. (2015). *SPEC kit 348: Rapid fabrication/makerspace services*.

- Anonymous (2014). Library Cafés. *Library Administrator's Digest*, 49(1), 6.
- Applegate, R. (2009). The library is for studying: Student preferences for study space. *The Journal of Academic Librarianship*, 35(4), 341-346.
- Asher, A. D. (2017). Space use in the commons: Evaluating a flexible library environment. *Evidence Based Library and Information Practice*, 12(2), 68-89.
- Bennett, S. (2007). First questions for designing higher education learning spaces. *The Journal of Academic Librarianship*, 33(1), 14-26.
- Blummer, B., & Kenton, J. M. (2017). Learning Commons in Academic Libraries: Discussing Themes in the Literature from 2001 to the Present. *New Review of Academic Librarianship*, 23(4), 329-352.
- Bryant, J., Matthews, G., & Walton, G. (2009). Academic libraries and social and learning space: A case study of Loughborough University Library, UK. *Journal of Librarianship and Information Science*, 41(1), 7-18.
- Bryman, A. (2015). *Social research methods*: Oxford university press.
- Calvert, P. (2017). Uncommon Ground: The Place of Cafés in Libraries. *Public Library Quarterly*, 36(3), 259-263.
- Cao, F., Wu, S., & Stvilia, B. (2020). Library makerspaces in China: A comparison of public, academic, and school libraries. *Journal of Librarianship and Information Science*, 52(4), 1209-1223.
- Chan, M.K.Y.\*, Chiu, D.K.W., Lam, E.T.H.+ (2020) Effectiveness of overnight learning commons: a comparative study, *The Journal of Academic Librarianship*, 46(7), 102253.
- Cunningham, M., & Walton, G. (2016). Informal learning spaces (ILS) in university libraries and their campuses: A Loughborough University case study. *New Library World*, 117(1/2), 49-62. doi:10.1108/NLW-04-2015-0031
- DeFrain, E., & Hong, M. (2020). Interiors, affect, and use: How does an academic library's learning commons support students' needs? *Evidence Based Library and Information Practice*, 15(2), 42-68.
- Demas, S., & Scherer, J. A. (2002). Esprit de Place: Maintaining and designing library buildings to provide transcendent spaces. *American Libraries*, 33(4), 65-68.
- Deng, Q., Allard, B., Lo, P., Chiu, D. K. W., See-To, E. W. K., & Bao, A. Z. R. (2017). The role of the library café as a learning space: A comparative analysis of three universities. *Journal of Librarianship and Information Science*, 51(3), 823-842.
- Donkai, S., Toshimori, A., & Mizoue, C. (2011). Academic libraries as learning spaces in Japan: Toward the development of learning commons. *The International Information & Library Review*, 43(4), 215-220.
- Dukic, Z., D.K.W. Chiu, Patrick Lo (2015). How useful are smartphones for learning? Perceptions and practices of Library and Information Science students from Hong Kong and Japan, *Library Hi Tech*, 33(4), 545-561.
- Fallin, L. (2016). Beyond books: the concept of the academic library as learning space. *New Library World*, 117(5/6), 308-320.
- Fister, B. (2009). The glorious study hall: how libraries nurture a life of the mind. *Library Issues*, 30(2), 1-4.
- Fong, K. C. H., Au, C. H., Lam, E. T. H., & Chiu, D. K. (2020). Social network services for academic libraries: A study based on social capital and social proof. *The Journal of Academic Librarianship*, 46(1), 102091.
- Freeman, G. T. (2005). The library as place: Changes in learning patterns, collections, technology, and use. In.
- Garnar, M., & Tonyan, J. (2021). Library as place: Understanding contradicting user expectations. *The Journal of Academic Librarianship*, 47(5), 102391.
- Gayton, J. T. (2008). Academic libraries: "Social" or "communal?" The nature and future of academic libraries. *The Journal of Academic Librarianship*, 34(1), 60-66.
- Harris, C. (2007). Libraries with lattes: The new third place. *Australasian Public Libraries and Information Services*, 20(4), 145.
- Harrop, D., & Turpin, B. (2013). A study exploring learners' informal learning space behaviors, attitudes, and preferences. *New Review of Academic Librarianship*, 19(1), 58-77.
- Hegde, A. L., Boucher, T. M., & Lavelle, A. D. (2018). How do you work? Understanding user needs for responsive study space design. *College and Research Libraries*, 79(7), 895-915.
- Hillman, C., Blackburn, K., Shamp, K., & Nunez, C. (2017). User-focused, user-led: Space assessment to transform a small academic library. *Evidence Based Library and Information Practice*, 12(4), 41-61.
- Huang, Y., & Wang, L. (2021) Net generation, digital natives and learning commons. In: *Vol. 1244 AISC. Advances in Intelligent Systems and Computing* (pp. 557-563).
- Jon, B. (2009). Information and learning commons, faculty and student benefits. *New Library World*, 110(9/10), 403-409.
- Jonathan, H., & Andrew, C. (2014). Learning over tea! Studying in informal learning spaces. *New Library World*, 115(1/2), 34-50.
- Lam, E. T. H., Au, C. H., & Chiu, D. K. (2019). Analyzing the use of Facebook among university libraries in Hong Kong. *The Journal of Academic Librarianship*, 45(3), 175-183.
- Leung, T.N., Luk, C.K.L., Chiu, D.K.W., Kevin, K.K.W. (2021) User perceptions, academic library usage, and social capital: A correlation analysis under COVID-19 after library renovation. *Library Hi Tech*
- Li, L. H., Wu, F., & Su, B. (2018). Impacts of Library Space on Learning Satisfaction – An Empirical Study of University

- Library Design in Guangzhou, China. *The Journal of Academic Librarianship*, 44(6), 724-737.
- Mark, B., & Marcus, F. (2013). Libraries as coworking spaces; Understanding user motivations and perceived barriers to social learning. *Library Hi Tech*, 31(2), 254-273.
- Masters, D. C., Arneson, J., & Lutton, H. D. (1994). Cafe Gelman: An innovative use of library space. *The Journal of Academic Librarianship*, 19(6), 388-391.
- Moore, R. (2006). *New life for older libraries: the Joondalup Libraries strategy*. Paper presented at the Places and spaces: public libraries for the 21st century in Australian and New Zealand: conference proceedings.
- Morell, D. B. (2004). The way ahead: learning cafés in the academic marketplace. *Library Hi Tech*, 22(3), 323-327.
- Maceli, M. G. (2019). Making the future makers Makerspace curriculum in library and information science graduate programs and continuing education. *Library Hi Tech*, 37(4), 781-793.
- Oldenburg, R. (1997). Our vanishing third places. *Planning Commissioners Journal*, 25(4), 6-10.
- Pierard, C., & Bordeianu, S. (2016). Learning commons reference collections in ARL libraries. *Reference Services Review*, 44(3), 411-430.
- Ramsden, B. (2011). Evaluating the impact of learning space. *Reference Services Review*, 39(3), 451-464.
- Wai, I. S. H., Ng, S. S. Y., Chiu, D.K.W., Ho, K. K., & Lo, P. (2018). Exploring undergraduate students' usage pattern of mobile apps for education. *Journal of Librarianship and Information Science*, 50 (1), 34-47
- Wang, P., Chiu, D. K. W., Ho, K. K. W., & Lo, P. (2016). Why read it on your mobile device? Change in reading habit of electronic magazines for university students. *The Journal of Academic Librarianship*, 42(6), 664-669.
- Waxman, L., Clemons, S., Banning, J., & McKelfresh, D. (2007). The library as place: Providing students with opportunities for socialization, relaxation, and restoration. *New Library World*, 108(9/10), 424-434.
- Webb, K. M., Schaller, M. A., & Hunley, S. A. (2008). Measuring library space use and preferences: Charting a path toward increased engagement. *portal: Libraries and the Academy*, 8(4), 407-422.
- Wójcik, M. (2019). How to design innovative information services at the library?. *Library Hi Tech*, 37(2), 138-154.