

# APH103 FINAL PROJECT REPORT

Investigate the Availability and Flexibility of Part-Time Study Options in XJTLU Using Two-Stage Sampling and Post-stratification Sampling



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### **Summary**

### Background

This study investigates the availability and flexibility of part-time study options at Xi'an Jiaotong-Liverpool University (XJTLU), aiming to evaluate the effectiveness of the university's support systems for students engaging in free-time learning activities. The research is significant as it provides insights into how XJTLU caters to the diverse learning needs and preferences of its student body, thereby influencing academic and personal development.

### **Methods**

The analysis employed two-stage sampling and post-stratification sampling methods to estimate the availability and flexibility of part-time study options. Descriptive statistics, and two-way ANOVA analysis were conducted to analyze the data. For the availability estimate, the two-stage approach involved initial cluster selection using the Sen-Midzuno method of probability proportional to size  $\pi PS$  sampling, followed by systematic sampling within these clusters. Poststratification was used to adjust sample proportions to better reflect the population characteristics, enhancing the accuracy of estimates in the aspect of flexibility of part-time study options in XJTLU.

### **Findings**

The findings indicate high satisfaction levels among students with XJTLU's learning support, with 71.55% expressing positive sentiments. Over 85% of students reported strong personal time management skills, and approximately 80.28% believe they have a good learning environment. The study also found significant peer influence, with nearly 59.22% of students acknowledging

its positive impact on their learning. The mean additional learning activities per week were estimated at 11.85 hours, highlighting students' active engagement in enhancing their learning beyond regular class hours.

The flexibility of part-time study methods was underscored by the nearly equal distribution across various study methods, including self-study, club participation, peer study, teacher consultation, internships, and research.

### Interpretation

The results highlight XJTLU's commitment to offering a diverse range of learning opportunities, which not only enhances the academic experience but also prepares students for a wide range of professional and personal challenges. The university's success in integrating theoretical knowledge with practical experiences, fostering a collaborative learning atmosphere, and providing accessible faculty support is a testament to its dedication to excellence in education. The findings provide a solid foundation for further enhancements aimed at maximizing the learning potential of all students at XJTLU. The study also demonstrates the effectiveness of two-stage sampling and post-stratification sampling in providing precise estimates of educational outcomes, which can be beneficial for educational institutions looking to evaluate and improve their support systems.

### Introduction

In the rapidly evolving landscape of higher education, the role of universities in providing flexible and diverse learning opportunities has become increasingly crucial. As institutions strive to meet the diverse needs of their students, understanding the availability and flexibility of part-

time study options is essential. This study focuses on Xi'an Jiaotong-Liverpool University (XJTLU), a leading institution known for its innovative educational approaches and commitment to student success. The aim is to evaluate the effectiveness of XJTLU's support systems for students engaging in free-time learning activities, which are pivotal for academic and personal development.

The availability and flexibility of part-time study options are critical factors that influence students' ability to balance their academic commitments with other aspects of their lives. These options provide students with the opportunity to engage in self-directed learning, participate in extracurricular activities, and gain practical experience through internships and research. This study employs two-stage sampling and post-stratification sampling methods to estimate these aspects of part-time study options at XJTLU. The two-stage approach involves initial cluster selection using the Sen-Midzuno method of probability proportional to size ( $\pi$ PS) sampling (Dawodu et al., 2011), followed by systematic sampling within these clusters (Baquero et al., 2018; Galway et al., 2012; Stehman et al., 2009). Post-stratification is used to adjust sample proportions to better reflect the population characteristics, enhancing the accuracy of estimates in the aspect of flexibility of part-time study options in XJTLU (Holt & Smith, 1979). These methods were selected based on their demonstrated effectiveness in educational research for providing precise estimates, as supported by literature (Leonardo et al., 2012)(Baquero et al., 2018).

This research is significant as it provides insights into how XJTLU caters to the diverse learning needs and preferences of its student body. By understanding the availability and flexibility of part-time study options, the study aims to contribute to the broader understanding of how educational institutions can support students in maximizing their learning potential. The findings

of this study are expected to highlight XJTLU's commitment to offering a diverse range of

learning opportunities and its success in integrating theoretical knowledge with practical

experiences.

### Methods

### **Questionnaire Design**

- 1. Demographics
  - What is your Gender?
  - What is your academic year? (Options: □ Freshman □ Sophomore □ Junior □ Senior)

### 2. Flexibility of free time learning

- How do you primarily use your free time for learning? (Multiple Choice)
   (Options: □ Self-study in the library □ Participate in club activities □ Study with peers □ Consult teachers (e.g., office hours) □ Internship □ Research □ Other)
- What factors do you prioritize in free-time learning? (Multiple Choice) (Options:
   □ Interest of the learning content □ Relevance to future career □ Convenience (e.g., online learning) □ Social interaction (peer communication))

### 3. Availability of free time learning

What factors affect your learning effectiveness in free time? (Multiple Choice) (Options: □ Quality of resources (e.g., course materials, books) □ Personal time management □ Learning environment (e.g., quietness) □ Peer influence (e.g., classmates' motivation))

### 4. Studying Time Per Week

• How many hours of free time do you have per week for additional learning activities? (Enter numerical value)

### 5. Overall Satisfication of XJTLU Learning Support

How satisfied are you with the university's free-time learning support? (Options:
 Very satisfied 
 Satisfied 
 Neutral 
 Dissatisfied 
 Very dissatisfied)

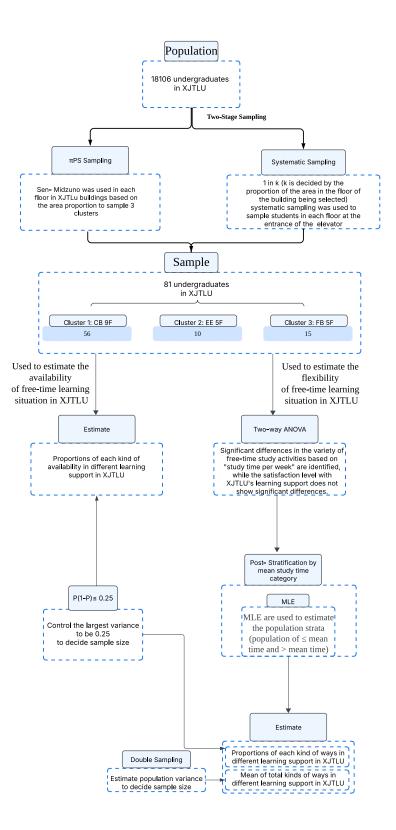
## 6. XJTLU Learning Support Improvement (Both are also included in "Flexibility" (2) and "Availability" (3) parts)

- What factors do you prioritize in free-time learning? (Multiple Choice) (Options:
   □ Interest of the learning content □ Relevance to future career □ Convenience (e.g., online learning) □ Social interaction (peer communication))
- What factors affect your learning effectiveness in free time? (Multiple Choice)
   (Options: □ Quality of resources (e.g., course materials, books) □ Personal time management

□ Learning environment (e.g., quietness) □ Peer influence (e.g., classmates' motivation))

### **Sampling Survey Design**

Figure1: Flow Chart



### **Model/Analysis**

### **Descriptive statistics**

Table 1 presents the distribution of various demographic and learning-related factors categorized by the satisfaction level of XJTLU learning support. The table includes data on gender, social interaction, quality of resources, personal time management ability, learning environment, peer influence, and other factors. The results indicate that the majority of respondents are satisfied or very satisfied with the learning support provided by XJTLU. For instance, 71.6% of the respondents are female, and within this group, 70.7% are satisfied or very satisfied with the learning support. The p-values suggest that there is no significant difference in the distribution of these factors across different satisfaction levels, except for the "Other" category, which shows a marginally significant difference (p=0.093).

	[ALL] N=81	Negative and Neutral N=23	Positive N=58	p.overall
Gender:				0.987
Female	58 (71.6%)	) 17 (73.9%)	41 (70.7%)	
Male	23 (28.4%)	• • •	17 (29.3%)	
Social interaction:				0.763
No	60 (74.1%)	) 16 (69.6%)	44 (75.9%)	
Yes		) 7 (30.4%)	14 (24.1%)	
Quality of resources:				1.000
No	18 (22.2%)	) 5 (21.7%)	13 (22.4%)	)
Yes	63 (77.8%)			
Personal time management ability:				1.000
No	12 (14.8%)	) 3 (13.0%)	9 (15.5%)	
Yes	69 (85.2%)	) 20 (87.0%)	49 (84.5%)	)
Good Learning environment:				0.529
No	16 (19.8%)	) 6 (26.1%)	10 (17.2%)	)
Yes	65 (80.2%)	) 17 (73.9%)	48 (82.8%)	)
Peer influence:				1.000
No	33 (40.7%)	9 (39.1%)	24 (41.4%)	)
Yes	48 (59.3%)	) 14 (60.9%)	34 (58.6%)	)
)ther:				0.093
No	74 (91.4%)	) 19 (82.6%)	55 (94.8%)	)
Yes	7 (8.64%)	4 (17.4%)	3 (5.17%)	
luster:				0.268
CB9F	56 (69.1%)	) 19 (82.6%)	37 (63.8%)	)
EE5F	10 (12.3%)	) 2 (8.70%)	8 (13.8%)	
FB5F	15 (18.5%)	) 2 (8.70%)	13 (22.4%)	)
study_time_category:				0.672
> mean	40 (49.4%)	) 10 (43.5%)	30 (51.7%)	)
≤ mean	41 (50.6%)	) 13 (56.5%)	28 (48.3%)	)

Table 1: Availability categorized by satisfaction level of XJTLU learning supports

Table 2 provides a detailed breakdown of the same factors but categorized by the amount of study time per week. The table shows that respondents who spend more than the mean study time per week tend to have different distributions in some factors compared to those who spend less. For example, 80.0% of respondents who study more than the mean are female, compared to 63.4% of those who study less. Even though, p-value indicates no significant difference in the distribution of these factors across different study time categories.

	[ALL] N=81	> mean N=40	≤ mean N=41	p.overall
Gender:				0.159
Female	58 (71.6%)	32 (80.0%)	26 (63.4%)	
Male	23 (28.4%)	8 (20.0%)	15 (36.6%)	
Satisfaction level of free time learning support:				0.672
Negative and Neutral	23 (28.4%)	10 (25.0%)	13 (31.7%)	
Positive	58 (71.6%)	30 (75.0%)	28 (68.3%)	
Social interaction:				0.280
0	60 (74.1%)	27 (67.5%)	33 (80.5%)	
1	21 (25.9%)	13 (32.5%)	8 (19.5%)	
Quality of resources:				1.000
No	18 (22.2%)	9 (22.5%)	9 (22.0%)	
Yes	63 (77.8%)	31 (77.5%)	32 (78.0%)	
Personal time management ability:				0.790
No	12 (14.8%)	5 (12.5%)	7 (17.1%)	
Yes	69 (85.2%)	35 (87.5%)	34 (82.9%)	
Good Learning environment:				0.180
No	16 (19.8%)	5 (12.5%)	11 (26.8%)	
Yes	65 (80.2%)	35 (87.5%)	30 (73.2%)	
Peer influence:				0.719
No	33 (40.7%)	15 (37.5%)	18 (43.9%)	
Yes	48 (59.3%)	25 (62.5%)	23 (56.1%)	
Other:				0.716
No	74 (91.4%)	36 (90.0%)	38 (92.7%)	
Yes	7 (8.64%)	4 (10.0%)	3 (7.32%)	
Cluster:				0.038
CB9F	56 (69.1%)	27 (67.5%)	29 (70.7%)	
EE5F	10 (12.3%)	2 (5.00%)	8 (19.5%)	
FB5F	15 (18.5%)	11 (27.5%)	4 (9.76%)	

Table 2: Availability categorized by study time per week

Since the above 2 discriptive tables show no significant difference in the distribution of the factors across different study time categories, we can use two stage sampling with the first stage

being the building clusters using  $\pi PS$  sampling of Sen-Midzuno Method and the second stage being the students within those clusters using systematic sampling.

Table 3 focuses on the flexibility of free-time learning activities, categorized by study time per week. The table includes data on various learning activities such as self-study in the library, participating in club activities, studying with peers, consulting teachers, internships, and research. The results show significant differences in some activities based on study time per week. For instance, respondents who study more than the mean are more likely to engage in self-study in the library (92.5%) compared to those who study less (73.2%). The p-values indicate significant differences in some activities, such as self-study in the library (p=0.045) and participation in club activities (p=0.145).

		[ALL] N=81	> mean N=40	≤ mean N=41	p.overall
Gender:					0.159
Female	58	(71.6%)	32 (80.0%)	26 (63.4%)	
Male	23	(28.4%)	8 (20.0%)	15 (36.6%)	
Self-study in the library:					0.045
No	14	(17.3%)	3 (7.50%)	11 (26.8%)	
Yes	67	(82.7%)	37 (92.5%)	30 (73.2%)	
Participate in club activities:					0.145
No	60	(74.1%)	33 (82.5%)	27 (65.9%)	
Yes	21	(25.9%)	7 (17.5%)	14 (34.1%)	
Study with peers:					1.000
No	44	(54.3%)	22 (55.0%)	22 (53.7%)	
Yes	37	(45.7%)	18 (45.0%)	19 (46.3%)	
Consult teachers (e.g., office hours):					0.441
No	47	(58.0%)	21 (52.5%)	26 (63.4%)	
Yes	34	(42.0%)	19 (47.5%)	15 (36.6%)	
Internship:					0.280
No	60	(74.1%)	27 (67.5%)	33 (80.5%)	
Yes	21	(25.9%)	13 (32.5%)	8 (19.5%)	
Research:					0.055
No	50	(61.7%)	20 (50.0%)	30 (73.2%)	
Yes	31	(38.3%)	20 (50.0%)	11 (26.8%)	
Other:					0.191

Table 3: Flexibility categorized by study time per week

No Yes		33 (82.5%) 7 (17.5%)		
Sum of kinds		3.02 (1.48)		0.038
Interest of the learning content:				0.740
No	41 (50.6%)	19 (47.5%)	22 (53.7%)	
Yes	40 (49.4%)	21 (52.5%)	19 (46.3%)	
Relevance to future career:				0.546
No	17 (21.0%)	10 (25.0%)	7 (17.1%)	
Yes	64 (79.0%)	30 (75.0%)	34 (82.9%)	
Convenience:				0.923
No	46 (56.8%)	22 (55.0%)	24 (58.5%)	
Yes	35 (43.2%)	18 (45.0%)	17 (41.5%)	
Social interaction:				0.280
No	60 (74.1%)	27 (67.5%)	33 (80.5%)	
Yes	21 (25.9%)	13 (32.5%)	8 (19.5%)	
Satisfication level of free time learning support:				0.672
Negative and Neutral	23 (28.4%)	10 (25.0%)	13 (31.7%)	
Positive	58 (71.6%)	30 (75.0%)	28 (68.3%)	
Cluster:				0.040
CB9F	56 (69.1%)	27 (67.5%)	29 (70.7%)	
EE5F	10 (12.3%)	2 (5.00%)	8 (19.5%)	
FB5F	15 (18.5%)	11 (27.5%)	4 (9.76%)	

Following the descriptive statistics, we conducted a two-way ANOVA to analyze the interaction between the satisfaction level of free time learning support and study time category on the flexibility of free-time learning activities. Table 4 presents the results of a two-way ANOVA examining the interaction between satisfaction level of free-time learning support and study time per week on the sum of kinds of free-study ways. The analysis reveals a significant main effect of study time per week (F=4.193, p=0.044), indicating that respondents who study more than the mean tend to engage in a greater variety of free-study ways. However, there is no significant interaction effect between satisfaction level and study time per week (F=0.050, p=0.824).

Table 4: Sum of knids of free-study ways by satisfiction level and study time per week(Two-way ANOVA)Df Sum Sq Mean Sq F value Pr(>F)`Satisfication level of free time learning support`111.3711.3720.8800.35116.546.5374.1930.044 \*`Satisfication level of free time learning support`:study\_time\_category10.0880.09500.82477120.041.559

Therefore, for the estimate of the flexibility of free-time learning activities, method of sampling using two-stage cluster sampling with systematic sampling should be changed due to the

difference in the distribution of the factors across different study time categories. We will use post-stratification to adjust the sample proportion to better reflect the population characteristics.

#### Availability estimate

The two-stage sampling approach, with the first stage involving building clusters using the Sen-Midzuno method of probability proportional to size ( $\pi PS$ ) sampling and the second stage employing systematic sampling of students within those clusters, offers several advantages for estimating the availability of free-time learning activities. This methodological framework is particularly advantageous for several reasons (Dawodu et al., 2011):

### General Advantages of the Two-Stage Sampling Approach

In the context of estimating the availability of free-time learning activities at XJTLU, this approach ensures that the sample is representative of the diverse student population across different building clusters. By using the Sen-Midzuno method, which selects clusters based on their size (in this case, the area of the floors), we can ensure that larger and potentially more diverse clusters are adequately represented in the sample. This method reduces the risk of underrepresenting smaller but significant clusters, thereby enhancing the precision and reliability of our estimates.

### Specific Application at XJTLU

At XJTLU, the first stage of our sampling involved selecting three building clusters (CB9F, EE5F, and FB5F) using the Sen-Midzuno method of  $\pi PS$  sampling based on the area of each floor. This selection method ensured that the clusters chosen were proportionally representative of the total student population across the campus. The areas of the selected clusters were then

used to determine the sampling interval for the second stage, where systematic sampling was employed to select students within each cluster.

### Systematic Sampling within Clusters

In the second stage, we implemented systematic sampling to select students within the chosen clusters. Specifically, we collected data from 56 students in CB9F, 10 students in EE5F, and 15 students in FB5F. This systematic approach ensured that the sample was evenly distributed across the student population within each cluster, reducing potential biases and ensuring a more representative sample.

### Estimation of Availability and Satisfaction Levels

Using this two-stage sampling approach, we estimated the availability of various free-time learning activities, including the quality of resources (e.g., course materials, books), personal time management, learning environment (e.g., quietness), and peer influence (e.g., classmates' motivation). Additionally, we assessed the overall satisfaction of students with XJTLU's learning support, categorizing responses into "Negative and Neutral" (Neutral, Dissatisfied, Very dissatisfied) and "Positive" (Very satisfied, Satisfied).

Overall, the two-stage sampling approach employed in this study effectively balanced representativeness, precision, efficiency, and robustness. By initially selecting clusters based on their size using probability proportional to size ( $\pi$ PS) sampling, we ensured that our sample was representative of the diverse student population across the campus. This method not only captured the variability within the population but also reduced sampling variability, thereby increasing the precision of our estimates. The subsequent use of systematic sampling within these clusters further enhanced the representativeness of our sample while maintaining

efficiency. This approach was both cost-effective and time-efficient, as it minimized the logistical challenges associated with data collection across a large and dispersed population. Additionally, by accounting for the design effect introduced by the two-stage sampling in our analysis, we ensured that our estimates remained robust and reliable. This methodological framework thus provided a comprehensive and efficient means of estimating the availability of free-time learning activities and overall satisfaction with learning support at XJTLU.

### Calculation formula

(The specific results are present in the appendix codes with output)

### Sen-Midzuno Method of $\pi PS$

The probability of selecting a cluster i is proportional to its size  $N_i$  relative to the total population size N:

$$P_i = \frac{N_i}{N}$$

where:

- $N_i$  is the size of cluster i,
- *N* is the total population size.

1. First Stage: Sen-Midzuno Method of PPS Sampling

The number of clusters k to be selected can be determined using:

$$k = \left[\frac{n}{\bar{N}}\right]$$

where: - n is the desired total sample size, -  $\overline{N}$  is the average cluster size.

### 2. Second Stage: Systematic Sampling within Clusters

The sampling interval k is determined by:

$$k = \frac{N_i}{n_i}$$

where:

- $N_i$  is the size of cluster i,
- $n_i$  is the number of students to be sampled from cluster *i* (Scheaffer et al., 1990).

**Estimation of Population Parameters** 

### Population Mean Estimation

The population mean  $\mu$  can be estimated using the sample means from each cluster  $\bar{y}_i$  weighted by the cluster sizes:

$$\hat{\mu} = \sum_{i=1}^{k} w_i \, \bar{y}_i$$

where:

- $w_i = \frac{N_i}{N}$  is the weight for cluster *i*,
- $\bar{y}_i$  is the sample mean of cluster *i*,
- *k* is the number of clusters sampled.

### Between-Cluster Variance Component

The between-cluster variance component  $\sigma_B^2$  is calculated as:

$$\sigma_B^2 = \frac{\sum_{i=1}^k w_i \, (\bar{y}_i - \hat{\mu})^2}{k - 1}$$

### Within-Cluster Variance Component

The within-cluster variance component  $\sigma_W^2$  is calculated as:

$$\sigma_W^2 = \sum_{i=1}^k w_i \left( \frac{\sum_{j=1}^{n_i} (y_{ij} - \bar{y}_i)^2}{n_i - 1} \right)$$

where:

- $y_{ij}$  is the value of the *j*-th observation in cluster *i*,
- $n_i$  is the sample size in cluster *i*.

### **Total Variance Estimate**

The total variance estimate  $\hat{\sigma}^2$  combines the between-cluster and within-cluster variances:

$$\hat{\sigma}^2 = \sigma_B^2 + \sigma_W^2$$

### **Flexibility estimate**

Given the observed differences in the distribution of various factors across distinct study time categories, we have opted to employ post-stratification in our sampling process to estimate the sample proportions. This approach is specifically designed to enhance the accuracy of our estimates by aligning them more closely with the true population characteristics.

### Sampling Process

### MLE estimate for population strata numbers

Given the necessity of knowing the population strata numbers, we initiate the process by employing the Maximum Likelihood Estimation (MLE) to calculate the population variance using the initial sample data. Subsequently, this estimated variance serves as a critical parameter in determining the appropriate sample size for the post-stratification sampling phase. This approach ensures that our sample size is both statistically robust and representative of the population's true variance, thereby enhancing the precision of our subsequent analyses.

### Main sampling process

Our sampling process begins with the identification of two primary study time categories based on whether students' weekly study time exceeds the mean study time calculated from the initial sample data. This categorization is pivotal as it reflects natural divisions in students' study habits and is likely to influence their learning outcomes and satisfaction levels. Using the mean study time as a threshold, we categorize the students into two strata: those who study less than or equal to the mean time per week ("≤ mean") and those who study more ("> mean"). Post-stratification involves adjusting the sample weights based on the proportion of each stratum in the total population. This adjustment ensures that each stratum is represented in the sample in proportion to its presence in the population, thereby enhancing the representativeness of our sample.

### Specific Application at XJTLU with its advantages

In the context of investigating the flexibility of part-time study options at XJTLU, the application of post-stratification in our sampling methodology offers several key advantages. This approach

significantly enhances the representativeness of our sample by aligning it more closely with the population structure, ensuring that our estimates accurately reflect all student groups rather than just those who are over- or under-represented in our initial sample. By acknowledging and adjusting for the non-uniform distribution of study time across the student body, poststratification allows us to more accurately estimate proportions related to academic engagement and satisfaction, which are critical factors in understanding the effectiveness of part-time study options. This method also increases the precision of our estimates by reducing variance, which is particularly beneficial when analyzing categorical data such as satisfaction levels, where small sample sizes within strata can otherwise lead to high variability. Furthermore, the flexibility and adaptability of post-stratification enable researchers to tailor their sampling approach to the specific characteristics of the population being studied, a crucial aspect in educational research where student demographics and behaviors can vary widely. Ultimately, these more accurate and representative estimates empower educational institutions to make informed decisions regarding resource allocation, program development, and support services, thereby leading to improved outcomes for students and the enhancement of educational practices. In summary, the strategic use of post-stratification in our sampling process, driven by the observed differences in study time distributions, not only improves the reliability of our findings but also supports the development of more effective educational strategies and policies at XJTLU.

### Calculation formula

$$\hat{p} = \sum_{i=1}^{L} \frac{N_i}{N} p_i$$

$$\widehat{\operatorname{Var}(\hat{p}_{\text{post}})} = \frac{1}{n} \sum_{i=1}^{L} A_i \, s_i^2 + \frac{1}{n^2} \sum_{i=1}^{L} (1 - A_i) \, s_i^2 - \frac{1}{N} \sum_{i=1}^{L} A_i \, s_i^2$$

$$s_i^2 = \frac{\hat{p}_i(1-\hat{p}_i)}{n_i - 1}$$
$$ME = 2\sqrt{\hat{V}ar(\hat{p}_{post})}$$

(Scheaffer et al., 1990)

### Sample size calculation

### Sample size calculation for two-stage cluster sampling

To estimate the proportion of each factor relevant to the Availability of part-time study options in XJTLU undergraduate population, we need to calculate the sample size required for two-stage cluster sampling. The sample size can be calculated using the following formula:

$$n = \frac{Z^2 \cdot p \cdot (1-p)}{E^2}$$
$$p \cdot (1-p) \le 0.25$$
$$E \approx 0.1089$$
$$n = \frac{1.96^2 \cdot 0.25}{0.1089^2} \approx 81$$

### Sample size calculation for post-stratification sampling

To estimate the proportion of each factor relevant to the Flexibility of part-time study options in XJTLU undergraduate population, we need to calculate the sample size required for post-stratification sampling. The sample size can be calculated using the following formula (Same as the above two-stage cluster sampling):

$$n = \frac{Z^2 \cdot p \cdot (1-p)}{E^2}$$
$$p \cdot (1-p) \le 0.25$$
$$E \approx 0.1089$$
$$n = \frac{1.96^2 \cdot 0.25}{0.1089^2} \approx 81$$

To estimate the mean of the Sum of kinds variable in the Flexibility dataset, we can use the following formula for sample size calculation:

Firstly, double sampling is used to estimate the population variance for the Sum of kinds variable (Cox, 1952; Eberhardt & Simmons, 1987). The initial sample statistics revealed a mean of 2.728 and a variance of 1.600, based on a sample size of 81 students. To estimate the population variance, we utilized a two-stage cluster sampling approach. The between-cluster variance component was calculated to be 0.012, while the within-cluster variance component was 1.629. Combining these components, we obtained a total estimated population variance of 1.641. This method allowed us to account for the variability both within and between clusters, providing a more accurate and robust estimate of the population variance. The results indicate that the majority of the variance in the Sum of kinds variable is attributable to within-cluster differences, suggesting a high degree of heterogeneity in students' engagement with various free-time learning activities within each cluster.

Assuming the mean and variance of the initial sample are  $\bar{y}_1$  and  $s_1^2$ , respectively, with a sample size of  $n_1$ .

$$\bar{y}_1 = \frac{1}{n_1} \sum_{i=1}^{n_1} y_{1i}$$
$$s_1^2 = \frac{1}{n_1 - 1} \sum_{i=1}^{n_1} (y_{1i} - \bar{y}_1)^2$$

Assuming the mean and variance of the second-stage sample are  $\bar{y}_2$  and  $s_2^2$ , respectively, with a sample size of  $n_2$ .

$$\bar{y}_2 = \frac{1}{n_2} \sum_{i=1}^{n_2} y_{2i}$$

$$s_2^2 = \frac{1}{n_2 - 1} \sum_{i=1}^{n_2} (y_{2i} - \bar{y}_2)^2$$

In double sampling, the estimation of the population variance typically combines information from both stages of sampling. Assuming the first-stage sample is used to estimate the population mean, and the second-stage sample is used to estimate the population variance. The population variance can be estimated as follows:

$$\hat{\sigma}^2 = \frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}$$

between\_var = 
$$\frac{\sum_{i=1}^{n_{\text{clusters}}} n_i (\bar{y}_i - \bar{y}_{\text{total}})^2}{N - n_{\text{clusters}}}$$

Where:

- $n_i$  is the size of the *i*-th cluster.
- $\bar{y}_i$  is the mean of the *i*-th cluster.

- $\bar{y}_{\text{total}}$  is the overall mean of all clusters.
- *N* is the total population size.
- $n_{\text{clusters}}$  is the number of clusters.

within\_var = 
$$\frac{\sum_{i=1}^{n_{\text{clusters}}} (n_i - 1) s_i^2}{N - n_{\text{clusters}}}$$

Where: -  $s_i^2$  is the variance of the *i*-th cluster.

pop\_var\_estimate = between\_var + within\_var = 1.641042

The sample size then can be calculated using the following formula:

$$n = \frac{Z^2 \cdot \hat{\sigma}^2}{E^2}$$
$$E \approx 0.2789802$$
$$n = \frac{1.96^2 \cdot 1.641042}{0.2789802^2} \approx 81$$

### Results

The analysis of part-time study options at XJTLU reveals a high level of availability and flexibility, indicating a robust support system for students engaging in free-time learning activities. The findings underscore the university's commitment to fostering an environment that caters to the diverse learning needs and preferences of its student body.

### Availability estimate

Table 5: Avalibility estimates using Two-stage sampling (Cluster sampling for the first stage and Systematic sampling for the second stage)

Column	Level	Proportion_or_Mean	Variance	Standard_Error	Lower_Cl	Upper_Cl
Social interaction	Yes	0.2598271	0.0012445	0.0352773	0.1906848	0.3289693
Quality of resources	Yes	0.7789227	0.0022182	0.0470979	0.6866126	0.8712328
Personal time management ability	Yes	0.8516574	0.0013466	0.0366966	0.7797334	0.9235813
Good Learning environment	Yes	0.8027563	0.0008369	0.0289294	0.7460557	0.8594568
Peer influence	Yes	0.5920104	0.0016977	0.0412033	0.5112534	0.6727675
Other	Yes	0.0866150	0.0004968	0.0222889	0.0429296	0.1303004
Gender	Female	0.7153035	0.0014126	0.0375852	0.6416379	0.7889692
Gender	Male	0.2846965	0.0014126	0.0375852	0.2110308	0.3583621
Satisfication level of free time learning support	Positive	0.7155017	0.0019910	0.0446203	0.6280475	0.8029559
Satisfication level of free time learning support	Negative and Neutral	0.2844983	0.0019910	0.0446203	0.1970441	0.3719525
Time of additional learning activities per week		11.8547829	0.2147236	0.4633828	10.9465694	12.7629965

### High Satisfaction with Learning Support

A significant majority of students expressed positive satisfaction with the university's free-time learning support, with 71.55% indicating satisfaction levels. This high satisfaction rate is a testament to XJTLU's effective learning support systems and resources, which are crucial for students' academic and personal development.

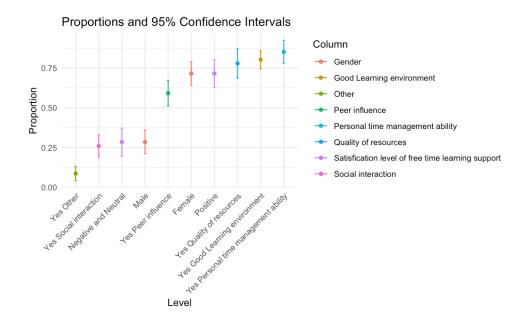
### **Access to Quality Learning Resources**

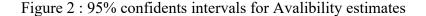
The availability of quality resources is a cornerstone of effective learning. Our estimates indicate that approximately 777.89% of students have access to high-quality learning materials and

books. This figure is particularly encouraging, as it suggests that students are well-equipped with the necessary tools to enhance their learning experiences outside of formal class settings.

### **Strong Personal Time Management Skills**

Over 85% of the students reported possessing strong personal time management abilities. This high proportion reflects XJTLU's success in empowering students with the skills needed to balance their academic commitments with other aspects of their lives, thereby facilitating a more efficient use of their free time for learning.





### **Positive Learning Environment**

The data also show that about 80.28% of students believe they have a good learning environment. This is a critical factor in promoting effective learning, as a conducive environments can significantly enhance students' motivation and engagement in their studies.

#### **Significant Peer Influence**

Peer influence was identified as a notable factor, with nearly 59.22% of students acknowledging its positive impact on their learning. This highlights the importance of social dynamics in the learning process and the role that peers play in fostering a supportive academic community.

### **Gender Distribution**

In terms of gender distribution, the sample reflects a balanced representation, with 71.53% female and 28.47% male students. This balance is important for ensuring that learning support and resources meet the needs of a diverse student population.

### **Additional Learning Activities**

The mean additional learning activities per week, estimated at 11.85 hours, further illustrates the active engagement of students in enhancing their learning beyond regular class hours. This commitment to additional learning is a positive indicator of students' dedication to their academic success.

### **Overall**

The high availability of part-time study options at XJTLU, as evidenced by the positive satisfaction rates, access to quality resources, and a supportive learning environment, positions the university as a leader in providing effective learning opportunities. These findings not only affirm the institution's commitment to student success but also provide a foundation for further enhancements aimed at maximizing the learning potential of all students.

### Estimate Availability using two-stage cluster sampling compared with SRS

 Table 6: Avalibility estimates using Simple Random Sampling (SRS) (Supose the method was

 SRS)

Column	Level	Proportion_or_Mean	Variance	Standard_Error	Lower_Cl	Upper_Cl
Social interaction	Yes Social interaction	0.2592593	0.0023709	0.0486920	0.1638247	0.3546939
Quality of resources	Yes Quality of resources	0.7777778	0.0021338	0.0461933	0.6872406	0.8683150
Personal time management ability	Yes Personal time management ability	0.8518519	0.0015580	0.0394719	0.7744884	0.9292153
Good Learning environment	Yes Good Learning environment	0.8024691	0.0019569	0.0442374	0.7157655	0.8891728
Peer influence	Yes Peer influence	0.5925926	0.0029806	0.0545946	0.4855891	0.6995961
Other	Yes Other	0.0864198	0.0009747	0.0312203	0.0252291	0.1476105
Gender	Female	0.7160494	0.0025102	0.0501015	0.6178523	0.8142464
Gender	Male	0.2839506	0.0025102	0.0501015	0.1857536	0.3821477
Satisfication level of free time learning support	Positive	0.7160494	0.0025102	0.0501015	0.6178523	0.8142464
Satisfication level of free time learning support	Negative and Neutral	0.2839506	0.0025102	0.0501015	0.1857536	0.3821477
Time of additional learning activities per week	Yes Time of additional learning activities per week	11.8641975	0.3860349	0.6213171	10.6464384	13.0819566

In comparing the two-stage cluster sampling method (first stage using PIPS and the second stage using systematic sampling) with Simple Random Sampling (SRS), we can analyze the variance estimates provided in the tables to understand the advantages and disadvantages of each method.

### Variance Comparison

Table 5 indicates that the variances for most variables are relatively low, indicating that this method provides precise estimates. For instance, the variance for "Social interaction" is 0.0012445, and for "Quality of resources" it is 0.0022182.

Table 6 (SRS) demonstrates that the variances here are generally higher compared to the cluster sampling method. For example, the variance for "Social interaction" is 0.0023709, and for "Quality of resources" it is 0.0021338.

The two-stage cluster sampling method offers several advantages over Simple Random Sampling (SRS), particularly in terms of precision, cost-effectiveness, and practicality. With lower variances observed in cluster sampling, it provides more precise estimates, which is highly beneficial for large and dispersed populations such as those found at Xi'an Jiaotong-Liverpool University (XJTLU). Additionally, this method can be more cost-effective by reducing travel and administrative costs through limiting data collection to selected clusters, making it a practical alternative when it is impractical to list every individual in the population. However, it's important to note that SRS, while seemingly straightforward, can also be challenging to implement in reality, especially in diverse and geographically spread-out institutions like XJTLU, where achieving true randomness might be difficult. Despite these advantages, two-stage cluster sampling also comes with increased complexity in implementation, a potential for bias if clusters are not representative, and possibly increased sampling error due to data grouping, especially in cases of high intra-cluster correlation.

### **Flexibility estimate**

Variable	Proportion	ME	Lower_Cl	Upper_Cl
Proportion_Self- study in the library	0.5006463	0.01765143	0.4829948	0.5182977
Proportion_Participa te in club activities	0.4979381	0.01673351	0.4812046	0.5146716
Proportion_Study with peers	0.4998328	0.01774208	0.4820907	0.5175749
Proportion_Consult teachers (e.g., office hours)	0.5007277	0.01762531	0.4831024	0.5183531
Proportion_Internshi p	0.5014728	0.01723815	0.4842347	0.5187110
Proportion_Research	0.5017959	0.01698411	0.4848118	0.5187800
Proportion_Other	0.5024743	0.01626683	0.4862075	0.5187411

Table 7: Flexibility estimates

The data presented in Table 7 provides a comprehensive overview of the flexibility in part-time study methods among students at Xi'an Jiaotong-Liverpool University (XJTLU). The proportions indicate a well-rounded engagement across various learning activities, reflecting the institution's commitment to offering a flexible and diverse educational environment.

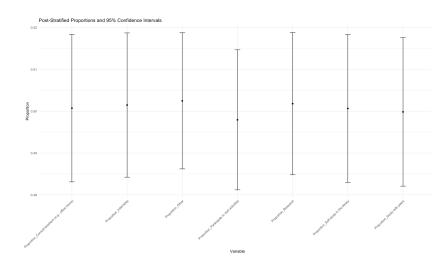
### Self-study in the Library:

With a proportion of 0.5006463, this method is nearly equally preferred, indicating that the library resources at XJTLU are highly utilized and valued by students. The low margin of error (ME of 0.01765143) suggests that this estimate is quite precise, reinforcing the significance of self-study as a key component of students' learning strategies.

### **Participate in Club Activities:**

The proportion of 0.4979381 shows that club activities are almost as popular as self-study, highlighting the importance of extracurricular involvement in students' overall educational experience. The ME of 0.01673351 further supports the reliability of this estimate.

Figure 3: 95% confidents intervals for Flexibility estimates



#### **Study with Peers:**

The proportion of 0.4998328 is very close to 0.5, suggesting that peer study is also a widely adopted method among students. This indicates a collaborative learning environment fostered by XJTLU, which is crucial for enhancing understanding and retention of knowledge.

### **Consult Teachers (e.g., Office Hours):**

The proportion of 0.5007277, with a ME of 0.01762531, indicates that students frequently seek guidance from their teachers, demonstrating the accessibility and support provided by the faculty at XJTLU.

### Internship:

With a proportion of 0.5014728, internships are slightly more popular than the midpoint, reflecting XJTLU's success in integrating practical work experience into the curriculum, which is vital for career preparation.

### **Research:**

The proportion of 0.5017959, with a ME of 0.01698411, shows that research activities are also highly valued, indicating XJTLU's emphasis on developing research skills among its students.

### **Other:**

The proportion of 0.5024743, with the lowest ME of 0.01626683 among all categories, suggests that students also explore other forms of learning, demonstrating the versatility and adaptability of XJTLU's educational offerings.

#### **Overall**

The data from Table 7 underscores the richness and flexibility of learning resources at XJTLU. The nearly equal distribution across various study methods indicates that the university provides a balanced and comprehensive educational experience. The low ME values across all categories suggest that these estimates are reliable, further validating the significance of each method in students' learning strategies. XJTLU's commitment to offering a diverse range of learning opportunities is evident in the high engagement rates in activities such as self-study, club participation, peer study, teacher consultation, internships, and research. This diversity not only enhances the academic experience but also prepares students for a wide range of professional and personal challenges they may encounter in their future careers. In conclusion, XJTLU's part-time study flexibility is commendable, offering students a robust and adaptable educational environment that caters to various learning preferences and styles. The university's success in integrating theoretical knowledge with practical experiences, fostering a collaborative learning atmosphere, and providing accessible faculty support is a testament to its dedication to excellence in education.

#### Estimate Flexibility using post-stratification sampling compared with SRS

Table 8: Sum of ways of studying (Flexibility) estimates using post-stratification sampling

Mean_Post	ME	Lower_Cl	Upper_Cl
2.735637	0.03056876	2.705068	2.766206

 Table 9: Sum of ways of studying (Flexibility) estimates using Simple Random Sampling (SRS) (Supose the method was SRS)

Mean_SRS	ME	Lower_Cl	Upper_Cl
2.728395	0.2804889	2.447906	3.008884

Post-stratification offers a refined approach to sampling by adjusting survey data to align more closely with known population characteristics, thereby enhancing the precision of estimates. This method is particularly advantageous when compared to simple random sampling (SRS), as evidenced by the lower mean square error (ME) and the narrower confidence interval observed in Table 8. The improved precision is a result of the sample distribution being more representative of the population structure, which is crucial for reducing bias and ensuring better representation. Additionally, post-stratification provides flexibility by allowing adjustments to be made after data collection, which is beneficial when the population structure is known but challenging to achieve in the initial sample design. However, post-stratification also comes with its set of challenges. Its implementation is more complex and requires detailed knowledge of the population characteristics, which can be difficult to obtain. The process can be resourceintensive, involving additional data collection and analysis to apply the necessary adjustments. Moreover, if the strata are not well-defined or if the adjustments are not correctly applied, errors can be introduced into the estimates. Despite these drawbacks, post-stratification remains a valuable tool when detailed population data is available and can be effectively used to improve the accuracy of survey estimates. In contrast, SRS, as shown in Table 9, offers simplicity and ease of implementation, making it suitable for situations where detailed population data is not available or when the population is relatively homogeneous. SRS ensures that every member of the population has an equal chance of being selected, which is important for research where fairness and equal representation are critical. However, SRS may not provide estimates as precise as post-stratification, particularly when the population structure is known and can be effectively utilized to improve the accuracy of the estimates. In summary, the choice between post-stratification and SRS should be based on the specific research context, including the

availability of population data, the heterogeneity of the population, and the resources available for data collection and analysis. Post-stratification can provide more precise estimates when the population structure is known and can be effectively used, while SRS is a more straightforward option when detailed population data is not accessible or when the population is relatively homogeneous.

### **Discussion and Conclusion**

The comprehensive analysis of part-time study options at Xi'an Jiaotong-Liverpool University (XJTLU), utilizing two-stage sampling and post-stratification sampling, reveals a robust and flexible educational framework that caters to the diverse needs of its student body. This investigation underscores XJTLU's commitment to providing a supportive and adaptable learning environment, which is crucial for the academic and personal development of its students.

### High Satisfaction and Availability of Learning Support

The findings indicate a high level of satisfaction among students with the university's free-time learning support, with approximately 71.55% expressing positive sentiments. This satisfaction rate is a strong indicator of the effectiveness of XJTLU's learning support systems and resources, which are integral to fostering a conducive learning atmosphere.

#### **Access to Quality Learning Resources**

The availability of high-quality learning materials and books is exceptional, with an estimated 77.79% of students having access to these resources. This high accessibility rate is particularly encouraging as it suggests that XJTLU students are well-equipped with the necessary tools to enhance their learning experiences outside of formal class settings.

### **Strong Personal Time Management Skills**

Over 85% of students reported possessing strong personal time management abilities, reflecting XJTLU's success in empowering students with essential skills to balance their academic commitments with other aspects of their lives. This skill set is vital for facilitating efficient use of free time for learning.

#### **Positive Learning Environment**

The data also show that about 80.28% of students believe they have a good learning environment. This positive perception is critical in promoting effective learning, as a conducive environment can significantly enhance students' motivation and engagement in their studies.

### **Significant Peer Influence**

Peer influence was identified as a notable factor, with nearly 59.22% of students acknowledging its positive impact on their learning. This highlights the importance of social dynamics in the learning process and the role that peers play in fostering a supportive academic community at XJTLU.

#### **Gender Distribution**

The gender distribution within the sample reflects a balanced representation, with 71.53% female and 28.47% male students. This balance is important for ensuring that learning support and resources meet the needs of a diverse student population.

### **Additional Learning Activities**

The mean additional learning activities per week, estimated at 11.85 hours, further illustrates the active engagement of students in enhancing their learning beyond regular class hours. This commitment to additional learning is a positive indicator of students' dedication to their academic success.

### **Flexibility in Part-Time Study Methods**

The data from Table 7 underscores the richness and flexibility of learning resources at XJTLU. The nearly equal distribution across various study methods indicates that the university provides a balanced and comprehensive educational experience. The low mean square error values across all categories suggest that these estimates are reliable, further validating the significance of each method in students' learning strategies.

XJTLU's commitment to offering a diverse range of learning opportunities is evident in the high engagement rates in activities such as self-study, club participation, peer study, teacher consultation, internships, and research. This diversity not only enhances the academic experience but also prepares students for a wide range of professional and personal challenges they may encounter in their future careers.

### Conclusion

In conclusion, XJTLU's part-time study flexibility is commendable, offering students a robust and adaptable educational environment that caters to various learning preferences and styles. The university's success in integrating theoretical knowledge with practical experiences, fostering a collaborative learning atmosphere, and providing accessible faculty support is a testament to its dedication to excellence in education. The findings from this investigation provide a solid foundation for further enhancements aimed at maximizing the learning potential of all students at XJTLU.

### **Appendix 1–codes with output**

```
Data Preparations
library(readxl)
library(dplyr)
Attaching package: 'dplyr'
The following objects are masked from 'package:stats':
    filter, lag
The following objects are masked from 'package:base':
    intersect, setdiff, setequal, union
library(tidyverse)

    Attaching core tidyverse packages -

                                                             - tidyverse 2.0.0
✓ forcats 1.0.0
                       ✓ readr
                                    2.1.5
✓ ggplot2 3.5.1 ✓ stringr
✓ lubridate 1.9.4 ✓ tibble
                                    1.5.1
                                    3.2.1
✓ purrr 1.0.2
                       ✓ tidyr
                                    1.3.1
— Conflicts —
                                                       - tidyverse conflicts()
x dplyr::filter() masks stats::filter()
x dplyr::lag() masks stats::lag()
```

onflicts to become errors Availability <- read\_xlsx("Availability.xlsx")</pre> Flexibility <- read xlsx("Flexibility.xlsx")</pre> Availability <- Availability %>% mutate(across(1:9, as.factor)) Availability <- Availability %>% mutate(Availability, `Time of additional learning activities per week` = as .numeric(`Time of additional learning activities per week`)) Availability\$`Satisfication level of free time learning support` <- factor(Av ailability\$`Satisfication level of free time learning support`, levels = c("Dissatisfied", "Neutral", "Satisfied", "Very dissatisfied", "Ver y satisfied"), labels = c("Negative and Neutral", "Negative and Neutral", "Positive", "Nega tive and Neutral", "Positive")) Flexibility\$`Satisfication level of free time learning support` <- factor(Fle</pre> xibility\$`Satisfication level of free time learning support`, levels = c("Dissatisfied", "Neutral", "Satisfied", "Very dissatisfied", "Ver y satisfied"), labels = c("Negative and Neutral", "Negative and Neutral", "Positive", "Nega tive and Neutral", "Positive")) library(readxl) Availability <- read\_xlsx("Availability.xlsx")</pre> Flexibility <- read xlsx("Flexibility.xlsx")</pre> Availability <- Availability %>% mutate(across(1:9, as.factor)) Availability <- Availability %>% mutate(Availability, `Time of additional learning activities per week` = as .numeric(`Time of additional learning activities per week`))

Use the conflicted package (<http://conflicted.r-lib.org/>) to force all c

Availability\$`Satisfication level of free time learning support` <- factor(Av ailability\$`Satisfication level of free time learning support`,

levels = c("Dissatisfied", "Neutral", "Satisfied", "Very dissatisfied", "Ver y satisfied"), lebels = c("Negative and Neutral", "Negative and Neutral", "Desitive", "Negative negative and Neutral", "Negative and Neutral", "Desitive", "Negative

labels = c("Negative and Neutral", "Negative and Neutral", "Positive", "Nega tive and Neutral", "Positive"))

Flexibility <- Flexibility %>%
 mutate(across(1:15, as.factor))
Flexibility <- Flexibility %>%
 mutate(Flexibility, `Time of additional learning activities per week` = as.
numeric(`Time of additional learning activities per week`))
Flexibility <- Flexibility %>%
 mutate(Flexibility, `Sum of kinds` = as.numeric(`Sum of kinds`))
Flexibility\$`Satisfication level of free time learning support` <- factor(Fle</pre>

```
xibility$`Satisfication level of free time learning support`,
    levels = c("Dissatisfied", "Neutral", "Satisfied", "Very dissatisfied", "Ver
y satisfied"),
    labels = c("Negative and Neutral", "Negative and Neutral", "Positive", "Nega
tive and Neutral", "Positive"))
```

N\_1<-5212 N\_2<-5061 N\_3<-4119 N\_4<-3714 N<-N\_1+N\_2+N\_3+N\_4 N

```
[1] 18106
```

CB

```
sampling process for "Availability"
```

Stage 1  $\pi PS$  Sampling to decide 3 clusters using Sen-Midzuno Method library(sampling)

CB 220000 9 24444.44 0.20992366

```
buildings <- c(</pre>
  "FB" = 32000, "CB" = 220000, "SA" = 11000, "SB" = 10000,
  "SC" = 12000, "SD" = 12000, "EE" = 22000, "EB" = 32000,
 "PB" = 15000, "IR" = 22000, "IA" = 20000, "HS" = 50000,
  "ES" = 32000, "DB" = 22000, "BS" = 80000, "MA" = 22000,
  "MB" = 22000, "GYM" = 32000, "AS" = 12000
)
# number of floors
floors <- c(
  "FB" = 5, "CB" = 9, "SA" = 5, "SB" = 5,
  "SC" = 5, "SD" = 5, "EE" = 5, "EB" = 5,
  "PB" = 5, "IR" = 5, "IA" = 5, "HS" = 5,
  "ES" = 5, "DB" = 5, "BS" = 5, "MA" = 5,
  "MB" = 5, "GYM" = 5, "AS" = 5
)
buildings_df <- data.frame(Building = names(buildings), Size = buildings, Flo</pre>
ors = floors, stringsAsFactors = FALSE)
buildings df$AvgSize <- buildings df$Size / buildings df$Floors
buildings df$Probability <- buildings df$AvgSize / sum(buildings df$AvgSize)
print(buildings_df)
    Building Size Floors AvgSize Probability
FB
          FB 32000 5 6400.00 0.05496183
```

SA	SA	11000	5	2200.00	0.01889313	
SB	SB	10000	5	2000.00	0.01717557	
SC	SC	12000	5	2400.00	0.02061069	
SD	SD	12000	5	2400.00	0.02061069	
EE	EE	22000	5	4400.00	0.03778626	
EB	EB	32000	5	6400.00	0.05496183	
PB	PB	15000	5	3000.00	0.02576336	
IR	IR	22000	5	4400.00	0.03778626	
IA	IA	20000	5	4000.00	0.03435115	
HS	HS	50000	5	10000.00	0.08587786	
ES	ES	32000	5	6400.00	0.05496183	
DB	DB	22000	5	4400.00	0.03778626	
BS	BS	80000	5	16000.00	0.13740458	
MA	MA	22000	5	4400.00	0.03778626	
MB	MB	22000	5	4400.00	0.03778626	
GYM	GYM	32000	5	6400.00	0.05496183	
AS	AS	12000	5	2400.00	0.02061069	
# number	of c	luctor				

# number of cluster

```
sample_size <- 3</pre>
```

set.seed(520)

```
first_sample <- sample(buildings_df$Building, size = 1, prob = buildings_df$P
robability)</pre>
```

```
remaining_buildings <- buildings_df[!buildings_df$Building %in% first_sample,
]
sample_indices <- sample(nrow(remaining_buildings), size = sample_size - 1)</pre>
```

```
sample_buildings <- rbind(
    buildings_df[buildings_df$Building == first_sample, ],
    remaining_buildings[sample_indices, ]
)
```

```
print("Sampled Buildings:")
```

```
[1] "Sampled Buildings:"
```

print(sample\_buildings)

	Building	Size	Floors	AvgSize	Probability
СВ	CB	220000	9	24444.44	0.20992366
ΕE	EE	22000	5	4400.00	0.03778626
FB	FB	32000	5	6400.00	0.05496183

```
Stage 2 - Systematic Sampling to select 81 students from each cluster
total_sample_size <- 81 # number of samples
sample_buildings$Systematic_number <- round(total_sample_size * sample_buildi</pre>
```

```
ngs$Probability/sum(sample_buildings$Probability))
```

```
print("Sample Size per Building:")
```

[1] "Sample Size per Building:"

print(sample\_buildings\$Systematic\_number)

[1] 56 10 15

56+10+15 == 81

[1] TRUE

```
Substitute into the equations to calculate proportion and corresponding variance
(Availability)
# Function to calculate proportions and variance for two-stage cluster sampli
ng
calculate proportions variance <- function(data, column name, sample building
s) {
  # Check if the column is binary (0/1) or categorical
  if(all(unique(data[[column name]]) %in% c(0, 1, NA))) {
    # Binary variable - calculate proportion of 1s
    cluster names <- unique(data$Cluster)</pre>
    cluster props <- numeric(length(cluster names))</pre>
    cluster sizes <- numeric(length(cluster names))</pre>
    for(i in seq_along(cluster_names)) {
      cluster_data <- data[data$Cluster == cluster_names[i], ]</pre>
      cluster sizes[i] <- nrow(cluster data)</pre>
      # Count occurrences of 1
      count <- sum(cluster_data[[column_name]] == 1, na.rm = TRUE)</pre>
      cluster props[i] <- count / cluster sizes[i]</pre>
    }
    # Match clusters to their buildings to get the weights
    cluster buildings <- substr(cluster names, 1, 2) # Extract building code
    weights <- numeric(length(cluster_names))</pre>
    for(i in seq along(cluster names)) {
      building_idx <- which(sample_buildings$Building == cluster buildings[i]</pre>
)
      if(length(building idx) > 0) {
        weights[i] <- sample buildings$Probability[building idx] / sum(sample</pre>
buildings$Probability)
      }
    }
    # Normalize weights
```

```
weights <- weights / sum(weights)</pre>
    # Overall proportion estimate (weighted mean of cluster proportions)
    overall prop <- sum(weights * cluster props)</pre>
    # Variance calculation
    # First stage variance (between clusters)
    var_between <- sum(weights^2 * (cluster_props - overall_prop)^2) / (lengt</pre>
h(cluster names) - 1)
    # Second stage variance (within clusters, for systematic sampling)
    n i <- sample buildings$Systematic number # Samples per cluster</pre>
    var_within <- sum(weights^2 * cluster_props * (1 - cluster_props) / (n_i</pre>
- 1)) / length(cluster names)
    # Total variance
    total var <- var between + var within
    return(list(
      proportion = overall prop,
      variance = total var,
      standard_error = sqrt(total_var)
    ))
  } else {
    # Categorical variable - calculate proportion for each level
    levels <- unique(data[[column name]])</pre>
    levels <- levels[!is.na(levels)]</pre>
    results <- list()</pre>
    for(level in levels) {
      # Create temporary binary indicator for this level
      data$temp indicator <- ifelse(data[[column name]] == level, 1, 0)</pre>
      # Calculate using the same method as binary variables
      level result <- calculate proportions variance(data, "temp indicator",
sample buildings)
      results[[as.character(level)]] <- level result</pre>
      # Clean up
      data$temp_indicator <- NULL</pre>
    }
    return(results)
  }
}
# Apply to columns of interest
```

```
# Define columns to analyze
binary_columns <- c("Social interaction", "Quality of resources",</pre>
                     "Personal time management ability", "Good Learning enviro
nment",
                     "Peer influence", "Other")
categorical_columns <- c("Gender", "Satisfication level of free time learning</pre>
 support")
numeric_columns <- c("Time of additional learning activities per week")</pre>
# Calculate proportions and variances
results <- list()</pre>
# Binary columns
for(col in binary columns) {
  results[[col]] <- calculate proportions variance(Availability, col, sample</pre>
buildings)
}
# Categorical columns
for(col in categorical columns) {
  results[[col]] <- calculate_proportions_variance(Availability, col, sample_</pre>
buildings)
}
# For numeric column, we calculate mean instead of proportion
# Define function for mean estimation
calculate mean variance <- function(data, column name, sample buildings) {</pre>
  cluster_names <- unique(data$Cluster)</pre>
  cluster means <- numeric(length(cluster names))</pre>
  cluster sizes <- numeric(length(cluster names))</pre>
  cluster vars <- numeric(length(cluster names))</pre>
  for(i in seg along(cluster names)) {
    cluster data <- data[data$Cluster == cluster names[i], ]</pre>
    cluster sizes[i] <- nrow(cluster data)</pre>
    # Calculate mean and variance within cluster
    values <- cluster data[[column name]]</pre>
    cluster_means[i] <- mean(values, na.rm = TRUE)</pre>
    cluster_vars[i] <- var(values, na.rm = TRUE)</pre>
  }
  # Match clusters to buildings to get weights
  cluster buildings <- substr(cluster names, 1, 2)</pre>
  weights <- numeric(length(cluster_names))</pre>
  for(i in seq along(cluster names)) {
```

```
building idx <- which(sample buildings$Building == cluster buildings[i])</pre>
    if(length(building idx) > 0) {
      weights[i] <- sample_buildings$Probability[building_idx] / sum(sample_b</pre>
uildings$Probability)
    }
  }
  # Normalize weights
  weights <- weights / sum(weights)</pre>
  # Overall mean estimate
  overall mean <- sum(weights * cluster_means)</pre>
  # Variance calculation
  var_between <- sum(weights^2 * (cluster_means - overall_mean)^2) / (length(</pre>
cluster_names) - 1)
  # Within variance for systematic sampling
  n i <- sample buildings$Systematic number</pre>
  var_within <- sum(weights^2 * cluster_vars / n_i) / length(cluster_names)</pre>
  # Total variance
  total_var <- var_between + var_within</pre>
  return(list(
    mean = overall_mean,
    variance = total var,
    standard_error = sqrt(total_var)
  ))
}
# Calculate for numeric column
for(col in numeric columns) {
  results[[col]] <- calculate mean variance(Availability, col, sample buildin
gs)
}
# Display results
for(col in names(results)) {
  cat("\nResults for column:", col, "\n")
  if(col %in% categorical_columns) {
    for(level in names(results[[col]])) {
      cat("Level:", level, "\n")
      cat(" Proportion:", round(results[[col]][[level]]$proportion, 4), "\n"
)
     cat(" Variance:", round(results[[col]][[level]]$variance, 6), "\n")
      cat(" Standard Error:", round(results[[col]][[level]]$standard_error,
4), "\n")
    }
```

```
} else if(col %in% numeric columns) {
    cat(" Mean:", round(results[[col]]$mean, 4), "\n")
    cat(" Variance:", round(results[[col]]$variance, 6), "\n")
    cat(" Standard Error:", round(results[[col]]$standard_error, 4), "\n")
  } else {
    cat(" Proportion:", round(results[[col]]$proportion, 4), "\n")
   cat(" Variance:", round(results[[col]]$variance, 6), "\n")
    cat(" Standard Error:", round(results[[col]]$standard_error, 4), "\n")
 }
}
Results for column: Social interaction
  Proportion: 0.2598
  Variance: 0.001244
  Standard Error: 0.0353
Results for column: Quality of resources
  Proportion: 0.7789
  Variance: 0.002218
  Standard Error: 0.0471
Results for column: Personal time management ability
  Proportion: 0.8517
  Variance: 0.001347
  Standard Error: 0.0367
Results for column: Good Learning environment
  Proportion: 0.8028
  Variance: 0.000837
  Standard Error: 0.0289
Results for column: Peer influence
  Proportion: 0.592
  Variance: 0.001698
  Standard Error: 0.0412
Results for column: Other
  Proportion: 0.0866
  Variance: 0.000497
  Standard Error: 0.0223
Results for column: Gender
Level: Female
  Proportion: 0.7153
  Variance: 0.001413
  Standard Error: 0.0376
Level: Male
  Proportion: 0.2847
```

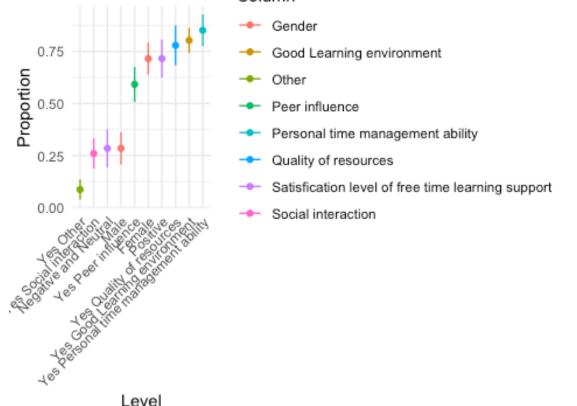
```
Variance: 0.001413
  Standard Error: 0.0376
Results for column: Satisfication level of free time learning support
Level: Positive
  Proportion: 0.7155
  Variance: 0.001991
  Standard Error: 0.0446
Level: Negative and Neutral
  Proportion: 0.2845
  Variance: 0.001991
  Standard Error: 0.0446
Results for column: Time of additional learning activities per week
  Mean: 11.8548
  Variance: 0.214724
  Standard Error: 0.4634
table and plots of CIs
library(dplyr)
library(ggplot2)
library(knitr)
library(kableExtra)
Attaching package: 'kableExtra'
The following object is masked from 'package:dplyr':
    group_rows
# Create a data frame to store the results
results_df <- data.frame(</pre>
  Column = character(),
  Level = character(),
  Proportion or Mean = numeric(),
  Variance = numeric(),
  Standard_Error = numeric(),
  Lower_CI = numeric(),
 Upper CI = numeric(),
  stringsAsFactors = FALSE
)
# Populate the data frame with results
for(col in names(results)) {
  if(col %in% categorical_columns) {
    for(level in names(results[[col]])) {
      results df <- results df %>%
        add row(
          Column = col,
```

```
Level = level,
          Proportion or Mean = results[[col]][[level]]$proportion,
          Variance = results[[col]][[level]]$variance,
          Standard_Error = results[[col]][[level]]$standard_error,
          Lower_CI = results[[col]][[level]]$proportion - qnorm(0.975) * resu
lts[[col]][[level]]$standard_error,
          Upper_CI = results[[col]][[level]]$proportion + qnorm(0.975) * resu
lts[[col]][[level]]$standard_error
        )
    }
  } else if(col %in% numeric_columns) {
    results_df <- results_df %>%
      add row(
        Column = col,
        Level = paste("Yes", col), # Use "Yes" followed by the column name
        Proportion_or_Mean = results[[col]]$mean,
        Variance = results[[col]]$variance,
        Standard Error = results[[col]]$standard error,
        Lower CI = results[[col]]$mean - qnorm(0.975) * results[[col]]$standa
rd_error,
        Upper_CI = results[[col]]$mean + qnorm(0.975) * results[[col]]$standa
rd_error
      )
  } else {
    results_df <- results_df %>%
      add row(
        Column = col,
        Level = paste("Yes", col), # Use "Yes" followed by the column name
        Proportion_or_Mean = results[[col]]$proportion,
        Variance = results[[col]]$variance,
        Standard_Error = results[[col]]$standard_error,
        Lower_CI = results[[col]]$proportion - qnorm(0.975) * results[[col]]$
standard error,
        Upper CI = results[[col]]$proportion + qnorm(0.975) * results[[col]]$
standard_error
      )
  }
}
# Save the results as a CSV file
write.csv(results df, file = "results table.csv", row.names = FALSE)
# Display the results in a nicely formatted table
#kable(results_df, format = "html", escape = FALSE) %>%
  #kable styling(bootstrap options = c("striped", "hover"), full width = FALS
E)
# Filter the data frame to include only proportions
proportions_df <- results_df %>%
filter(!is.na(Level) & Level != "Yes" & Level != paste("Yes", col)) # Excl
```

#### ude numeric columns

```
# Plot the proportions with 95% confidence intervals
ggplot(proportions_df, aes(x = reorder(Level, Proportion_or_Mean), y = Propor
tion_or_Mean, color = Column)) +
geom_point() +
geom_errorbar(aes(ymin = Lower_CI, ymax = Upper_CI), width = 0.1, position
= position_dodge(width = 0.8)) +
labs(title = "Proportions and 95% Confidence Intervals",
        x = "Level",
        y = "Proportion",
        color = "Column") +
theme_minimal() +
theme(axis.text.x = element_text(angle = 45, hjust = 1))
```

# Proportions and 95% Confidence Intervals



#### **Comparison with SRS**

```
# Function to calculate proportions and variance for simple random sampling
calculate_proportions_variance_SRS <- function(data, column_name) {
    # Check if the column is binary (0/1) or categorical
    if(all(unique(data[[column_name]]) %in% c(0, 1, NA))) {
        # Binary variable - calculate proportion of 1s
        total_n <- nrow(data)
        count <- sum(data[[column_name]] == 1, na.rm = TRUE)</pre>
```

```
proportion <- count / total n
    # Variance calculation for proportion in SRS
    variance <- proportion * (1 - proportion) / total n</pre>
    # Standard error
    standard_error <- sqrt(variance)</pre>
    return(list(
      proportion = proportion,
      variance = variance,
      standard_error = standard_error
    ))
  } else {
    # Categorical variable - calculate proportion for each level
    levels <- unique(data[[column_name]])</pre>
    levels <- levels[!is.na(levels)]</pre>
    results <- list()</pre>
    for(level in levels) {
      # Create temporary binary indicator for this level
      data$temp_indicator <- ifelse(data[[column_name]] == level, 1, 0)</pre>
      # Calculate using the same method as binary variables
      level_result <- calculate_proportions_variance_SRS(data, "temp_indicato")</pre>
r")
      results[[as.character(level)]] <- level_result</pre>
      # Clean up
      data$temp_indicator <- NULL</pre>
    }
    return(results)
  }
}
# Function to calculate mean and variance for numeric variables in SRS
calculate mean variance SRS <- function(data, column name) {</pre>
  total_n <- nrow(data)</pre>
  mean_value <- mean(data[[column_name]], na.rm = TRUE)</pre>
  variance <- var(data[[column name]], na.rm = TRUE) / total n</pre>
  standard_error <- sqrt(variance)</pre>
  return(list(
    mean = mean_value,
    variance = variance,
    standard_error = standard_error
  ))
```

}

```
# Calculate proportions and variances assuming SRS
results SRS <- list()</pre>
# Binary columns
for(col in binary columns) {
  results SRS[[col]] <- calculate proportions variance SRS(Availability, col)
}
# Categorical columns
for(col in categorical_columns) {
  results SRS[[col]] <- calculate proportions variance SRS(Availability, col)
}
# Numeric columns
for(col in numeric columns) {
  results_SRS[[col]] <- calculate_mean_variance_SRS(Availability, col)</pre>
}
# Create a data frame to store the SRS results
results SRS df <- data.frame(</pre>
  Column = character(),
  Level = character(),
  Proportion or Mean = numeric(),
  Variance = numeric(),
  Standard Error = numeric(),
  Lower CI = numeric(),
  Upper_CI = numeric(),
  stringsAsFactors = FALSE
)
# Populate the data frame with SRS results
for(col in names(results SRS)) {
  if(col %in% categorical columns) {
    for(level in names(results_SRS[[col]])) {
      results_SRS_df <- results_SRS_df %>%
        add row(
          Column = col,
          Level = level,
          Proportion_or_Mean = results_SRS[[col]][[level]]$proportion,
          Variance = results_SRS[[col]][[level]]$variance,
          Standard_Error = results_SRS[[col]][[level]]$standard_error,
          Lower CI = results SRS[[col]][[level]]$proportion - qnorm(0.975) *
results_SRS[[col]][[level]]$standard_error,
          Upper_CI = results_SRS[[col]][[level]]$proportion + qnorm(0.975) *
results_SRS[[col]][[level]]$standard_error
```

```
} else if(col %in% numeric columns) {
    results SRS df <- results SRS df %>%
      add row(
        Column = col.
        Level = paste("Yes", col), # Use "Yes" followed by the column name
        Proportion_or_Mean = results_SRS[[col]]$mean,
        Variance = results SRS[[col]]$variance,
        Standard_Error = results_SRS[[col]]$standard_error,
        Lower CI = results SRS[[col]]$mean - qnorm(0.975) * results SRS[[col]]
]$standard error,
        Upper_CI = results_SRS[[col]]$mean + qnorm(0.975) * results_SRS[[col]
]$standard_error
      )
  } else {
    results SRS df <- results SRS df %>%
      add row(
        Column = col,
        Level = paste("Yes", col), # Use "Yes" followed by the column name
        Proportion or Mean = results SRS[[col]]$proportion,
        Variance = results_SRS[[col]]$variance,
        Standard Error = results SRS[[col]]$standard error,
        Lower CI = results_SRS[[col]]$proportion - qnorm(0.975) * results_SRS
[[col]]$standard_error,
        Upper_CI = results_SRS[[col]]$proportion + qnorm(0.975) * results SRS
[[col]]$standard error
      )
 }
}
# Save the SRS results as a CSV file
#write.csv(results SRS df, file = "results SRS table.csv", row.names = FALSE)
# Display the SRS results in a nicely formatted table
#kable(results_SRS_df, format = "html", escape = FALSE) %>%
  #kable styling(bootstrap options = c("striped", "hover"), full width = FALS
E)
```

### Additional Sample process for "Flexibility"

```
Double sampling to estimate the population variance for deciding sample size
# Double sampling to estimate population variance for "Sum of kinds"
# First, analyze the initial sample from Flexibility dataset
# Calculate summary statistics for the initial sample
initial_sample_mean <- mean(Flexibility$`Sum of kinds`, na.rm = TRUE)
initial_sample_var <- var(Flexibility$`Sum of kinds`, na.rm = TRUE)
initial_sample_size <- sum(!is.na(Flexibility$`Sum of kinds`))
cat("Initial Sample Statistics for 'Sum of kinds':\n")</pre>
```

```
Initial Sample Statistics for 'Sum of kinds':
cat("Mean:", initial sample mean, "\n")
Mean: 2.728395
cat("Variance:", initial sample var, "\n")
Variance: 1.600309
cat("Sample Size:", initial_sample_size, "\n\n")
Sample Size: 81
# Estimate population variance using the initial sample
# For two-stage cluster sampling, we need to account for both stages
# Get unique clusters in the initial sample
clusters <- unique(Flexibility$Cluster)</pre>
n clusters <- length(clusters)</pre>
# Calculate cluster-level means
cluster means <- numeric(n clusters)</pre>
cluster_sizes <- numeric(n_clusters)</pre>
within cluster vars <- numeric(n clusters)</pre>
for(i in 1:n clusters) {
  cluster_data <- Flexibility[Flexibility$Cluster == clusters[i], ]</pre>
  cluster_sizes[i] <- nrow(cluster_data)</pre>
  cluster means[i] <- mean(cluster_data$`Sum of kinds`, na.rm = TRUE)</pre>
 within cluster vars[i] <- var(cluster data$`Sum of kinds`, na.rm = TRUE)</pre>
}
# Between-cluster component of variance
between_var <- sum(cluster_sizes * (cluster_means - initial_sample_mean)^2) /</pre>
  (sum(cluster sizes) - 1)
# Within-cluster component of variance (pooled)
within var <- sum((cluster sizes - 1) * within cluster vars) /
  (sum(cluster_sizes) - n_clusters)
# Estimate of population variance for two-stage sampling
pop var estimate <- between var + within var
cat("Estimated Population Variance Components for 'Sum of kinds':\n")
Estimated Population Variance Components for 'Sum of kinds':
cat("Between-Cluster Variance Component:", between_var, "\n")
```

Between-Cluster Variance Component: 0.01172233

```
cat("Within-Cluster Variance Component:", within_var, "\n")
```

Within-Cluster Variance Component: 1.629319

```
cat("Total Estimated Population Variance:", pop_var_estimate, "\n\n")
```

Total Estimated Population Variance: 1.641042

#### **Descript statistics and Analysis**

```
library(dplyr)
library(readxl)
Availability <- read_xlsx("Availability.xlsx")</pre>
Flexibility <- read xlsx("Flexibility.xlsx")</pre>
Availability <- Availability %>%
  mutate(across(1:9, as.factor))
Availability <- Availability %>%
  mutate(Availability, `Time of additional learning activities per week` = as
.numeric(`Time of additional learning activities per week`))
Availability$`Satisfication level of free time learning support` <- factor(Av
ailability$`Satisfication level of free time learning support`,
levels = c("Dissatisfied", "Neutral", "Satisfied", "Very dissatisfied", "Ver
y satisfied"),
labels = c("Negative and Neutral", "Negative and Neutral", "Positive", "Nega
tive and Neutral", "Positive"))
Flexibility$`Satisfication level of free time learning support` <- factor(Fle</pre>
xibility$`Satisfication level of free time learning support`,
levels = c("Dissatisfied", "Neutral", "Satisfied", "Very dissatisfied", "Ver
y satisfied"),
labels = c("Negative and Neutral", "Negative and Neutral", "Positive", "Nega
tive and Neutral", "Positive"))
library(openxlsx)
library(compareGroups)
library(dplyr)
mean study time <- mean(Availability$`Time of additional learning activities</pre>
per week`)
Availability$study time category <- ifelse(Availability$`Time of additional 1</pre>
earning activities per week` <= mean_study_time, "< mean", "> mean")
table1 <- compareGroups(`Satisfication level of free time learning support` ~
 , •
                        data = Availability %>%
                          select(-`Time of additional learning activities per
 week`),
                        method = 1,
                        compute.ratio = FALSE,
                        chisq.test.perm = TRUE,
```

p.corrected = TRUE) # method =1 --1- mean, standard d eviation and t-test or ANOVA when it is continuous variable. chisq.test.perm = TRUE means using chi-square test to test the categorical variable. p.correc ted=TRUE means using p-value correction method to correct the p-value. Do not compute ratio since it will have warning of "glm.fit: fitted probabilities n umerically 0 or 1 occurred" when using glm function. # show.p.overall=T indicates that the overall P-value is displayed in the tab le, indicating whether each variable has a significant difference between dif

ferent fspc groups
table1 <- createTable(table1, show.all=T, hide.no="no", show.p.overall=T)</pre>

table1

-----Summary descriptives table by 'Satisfication level of free time learn ing support'-----

	[ALL]	Negative and Neutral	Positive
p.overall	N=81	N=23	N=58
Gender: 0.987			
Female	58 (71.6%)	17 (73.9%)	41 (70.7%)
Male	23 (28.4%)	6 (26.1%)	17 (29.3%)
Social interaction: 0.763			
0	60 (74.1%)	16 (69.6%)	44 (75.9%)
1	21 (25.9%)	7 (30.4%)	14 (24.1%)
Quality of resources: 1.000			
0	18 (22.2%)	5 (21.7%)	13 (22.4%)
1	63 (77.8%)	18 (78.3%)	45 (77.6%)
Personal time management ability: 1.000			
0	12 (14.8%)	3 (13.0%)	9 (15.5%)
1	69 (85.2%)	20 (87.0%)	49 (84.5%)

Good Learning environment:

0.540 0	16 (19.8%)	6 (26.1%)	10 (17.2%)
1	65 (80.2%)	17 (73.9%)	48 (82.8%)
Peer influence: 1.000			
0	33 (40.7%)	9 (39.1%)	24 (41.4%)
1	48 (59.3%)	14 (60.9%)	34 (58.6%)
Other:			
0.095 0	74 (91.4%)	19 (82.6%)	55 (94.8%)
1	7 (8.64%)		
c]t.			
Cluster: 0.269			
CB9F	56 (69.1%)	19 (82.6%)	37 (63.8%)
EESF	10 (12.3%)	2 (8.70%)	8 (13.8%)
FB5F	15 (18.5%)	2 (8.70%)	13 (22.4%)
<pre>study_time_category: 0.672</pre>			
> mean	40 (49.4%)	10 (43.5%)	30 (51.7%)
≤ mean	41 (50.6%)	13 (56.5%)	28 (48.3%)
library(compareGroups) library(dplyr)			
	(Availability\$`Time of a	dditional learni	ng activities
	_category <- ifelse(Avai week` <= mean_study_time	-	
table2 <- compareGroups	<pre>(`study_time_category` ~   data = Availability %&gt;%     select(-`Time of addi</pre>		activities ner
week`),	Serece Time of duar	cional ica ning	accivicies per
	<pre>method = 1, compute.ratio = FALSE,</pre>		
	<pre>chisq.test.perm = TRUE, p.corrected = TRUE) # m</pre>		an, standard d

eviation and t-test or ANOVA when it is continuous variable. chisq.test.perm = TRUE means using chi-square test to test the categorical variable. p.correc ted=TRUE means using p-value correction method to correct the p-value. Do not compute ratio since it will have warning of "glm.fit: fitted probabilities n umerically 0 or 1 occurred" when using glm function.

# show.p.overall=T indicates that the overall P-value is displayed in the tab le, indicating whether each variable has a significant difference between dif ferent fspc groups

table2 <- createTable(table2, show.all=T, hide.no="no", show.p.overall=T)
table2</pre>

-----Summary descriptives table by 'study\_time\_category'------

[ALL] > mean <u><</u> mean p.overall N=81 N=40 Ν =41 -----Gender: 0.159 Female 58 (71.6%) 32 (80.0%) 26 ( 63.4%) Male 23 (28.4%) 8 (20.0%) 15 ( 36.6%) Satisfication level of free time learning support: 0.672 Negative and Neutral 23 (28.4%) 10 (25.0%) 13 ( 31.7%) Positive 58 (71.6%) 30 (75.0%) 28 ( 68.3%) Social interaction: 0.280 0 60 (74.1%) 27 (67.5%) 33 ( 80.5%) 1 21 (25.9%) 13 (32.5%) 8 (1 9.5%) Quality of resources: 1.000 18 (22.2%) 9 (22.5%) 9 (2 0 2.0%) 1 63 (77.8%) 31 (77.5%) 32 ( 78.0%) Personal time management ability: 0.790 0 12 (14.8%) 5 (12.5%) 7 (1 7.1%)

1 69 (85.2%) 35 (87.5%) 34 ( 82.9%) Good Learning environment: 0.180 16 (19.8%) 5 (12.5%) 11 ( 0 26.8%) 65 (80.2%) 35 (87.5%) 30 ( 1 73.2%) Peer influence: 0.719 33 (40.7%) 15 (37.5%) 18 ( 0 43.9%) 48 (59.3%) 25 (62.5%) 23 ( 1 56.1%)Other: 0.699 0 74 (91.4%) 36 (90.0%) 38 ( 92.7%) 7 (8.64%) 4 (10.0%) 3 (7 1 .32%) Cluster: 0.043 CB9F 56 (69.1%) 27 (67.5%) 29 ( 70.7%) 10 (12.3%) 2 (5.00%) 8 (1 EE5F 9.5%) 15 (18.5%) 11 (27.5%) 4 (9 FB5F .76%) . . . . . . . . . . . . . . . . . library(compareGroups) library(dplyr) mean study time <- mean(Flexibility\$`Time of additional learning activities p</pre> er week`) Flexibility\$study time category <- ifelse(Flexibility\$`Time of additional lea</pre> rning activities per week` <= mean\_study\_time, "≤ mean", "> mean") table3 <- compareGroups(`study\_time\_category` ~ .,</pre> data = Flexibility %>% select(-`Time of additional learning activities per week`), method = 1, compute.ratio = FALSE, chisq.test.perm = TRUE, **p.corrected = TRUE)** # method =1 --1- mean, standard d eviation and t-test or ANOVA when it is continuous variable. chisq.test.perm = TRUE means using chi-square test to test the categorical variable. p.correc ted=TRUE means using p-value correction method to correct the p-value. Do not compute ratio since it will have warning of "glm.fit: fitted probabilities n umerically 0 or 1 occurred" when using glm function. # show.p.overall=T indicates that the overall P-value is displayed in the tab le, indicating whether each variable has a significant difference between dif ferent fspc groups table3 <- createTable(table3, show.all=T, hide.no="no", show.p.overall=T) table3

-----Summary descriptives table by 'study\_time\_category'-----

<pre>&lt; mean p.overall N=44 Gender:</pre>	[ALL] N=81	> mean N=37
0.321		
Female	58 (71.6%)	29 (78.4%) 29
(65.9%)	(	- (
Male	23 (28.4%)	8 (21.6%) 15
(34.1%)		0 02 (0 28) 0
Self-study in the library 75 (0.44) 0.039	0.83 (0.38)	0.92 (0.28) 0.
Participate in club activities	0 26 (0 44)	0.19 (0.40) 0.
32 (0.47) 0.185	0.20 (0.44)	0.19 (0.40) 0.
Study with peers	0.46 (0.50)	0.41 (0.50) 0.
50 (0.51) 0.400	(,	(,
Consult teachers (e.g., office hours)	0.42 (0.50)	0.46 (0.51) 0.
39 (0.49) 0.514		
Internship	0.26 (0.44)	0.30 (0.46) 0.
23 (0.42) 0.484		
Research	0.38 (0.49)	0.49 (0.51) 0.
30 (0.46) 0.083		
0ther	0.12 (0.33)	0.19 (0.40) 0.
07 (0.25) 0.115 Sum of kinds	2 72 (1 27)	2 05 (1 40) 2
55 (1.02) 0.171	2.75 (1.27)	2.95 (1.49) 2.
Interest of the learning content	0.49 (0.50)	0.51 (0.51) 0.
48 (0.51) 0.749	(,	(,
Relevance to future career	0.79 (0.41)	0.73 (0.45) 0.
84 (0.37) 0.234		
Convenience	0.43 (0.50)	0.46 (0.51) 0.
41 (0.50) 0.654		
Social interaction	0.26 (0.44)	0.32 (0.47) 0.
20 (0.41) 0.232		
Satisfication level of free time learning support: 0.998		

```
Negative and Neutral
                                                     23 (28.4%) 10 (27.0%)
                                                                              13
 (29.5\%)
    Positive
                                                     58 (71.6%) 27 (73.0%)
                                                                              31
 (70.5\%)
Cluster:
            0.082
    CB9F
                                                     56 (69.1%) 25 (67.6%)
                                                                              31
 (70.5\%)
                                                                               8
    EE5F
                                                     10 (12.3%) 2 (5.41%)
 (18.2\%)
                                                     15 (18.5%) 10 (27.0%)
                                                                               5
    FB5F
 (11.4\%)
```

```
2-way ANOVA for Flexibility
library(readxl)
Availability <- read_xlsx("Availability.xlsx")</pre>
Flexibility <- read xlsx("Flexibility.xlsx")</pre>
Availability <- Availability %>%
  mutate(across(1:9, as.factor))
Availability <- Availability %>%
  mutate(Availability, `Time of additional learning activities per week` = as
.numeric(`Time of additional learning activities per week`))
Availability$`Satisfication level of free time learning support` <- factor(Av
ailability$`Satisfication level of free time learning support`,
levels = c("Dissatisfied", "Neutral", "Satisfied", "Very dissatisfied", "Ver
y satisfied"),
labels = c("Negative and Neutral", "Negative and Neutral", "Positive", "Nega
tive and Neutral", "Positive"))
Flexibility <- Flexibility %>%
  mutate(across(1:15, as.factor))
Flexibility <- Flexibility %>%
  mutate(Flexibility, `Time of additional learning activities per week` = as.
numeric(`Time of additional learning activities per week`))
Flexibility <- Flexibility %>%
  mutate(Flexibility, `Sum of kinds` = as.numeric(`Sum of kinds`))
Flexibility$`Satisfication level of free time learning support` <- factor(Fle</pre>
xibility$`Satisfication level of free time learning support`,
levels = c("Dissatisfied", "Neutral", "Satisfied", "Very dissatisfied", "Ver
y satisfied"),
labels = c("Negative and Neutral", "Negative and Neutral", "Positive", "Nega
tive and Neutral", "Positive"))
Flexibility$study time category <- ifelse(Flexibility$`Time of additional lea</pre>
rning activities per week` <= mean(Flexibility$`Time of additional learning a</pre>
ctivities per week`), "≤ mean", "> mean")
```

model <- aov(`Sum of kinds` ~ `Satisfication level of free time learning supp</pre> ort` \* study time category, data = Flexibility) summary(model) Df `Satisfication level of free time learning support` 1 study\_time\_category 1 `Satisfication level of free time learning support`:study\_time\_category 1 Residuals 77 Sum S q `Satisfication level of free time learning support` 1.3 7 study\_time\_category 6.5 4 `Satisfication level of free time learning support`:study time category 0.0 8 Residuals 120.0 4 Mean Sq `Satisfication level of free time learning support` 1.3 72 study time category 6.5 37 `Satisfication level of free time learning support`:study time category 0.0 78 Residuals 1.5 59 F val ue `Satisfication level of free time learning support` 0.8 80 study\_time\_category 4.1 93 `Satisfication level of free time learning support`:study time category 0.0 50 Residuals Pr(>F `Satisfication level of free time learning support` 0.35 1 study time category 0.04 4 `Satisfication level of free time learning support`:study time category 0.82 4 Residuals

```
`Satisfication level of free time learning support`
study_time_category
`Satisfication level of free time learning support`:study_time_category
Residuals
---
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

This means post-stratification is needed to adjust the sample proportion to better reflect the population characteristics.

Estimate Sum of kinds (Flexibility) of the optional study choices in XJTLU population

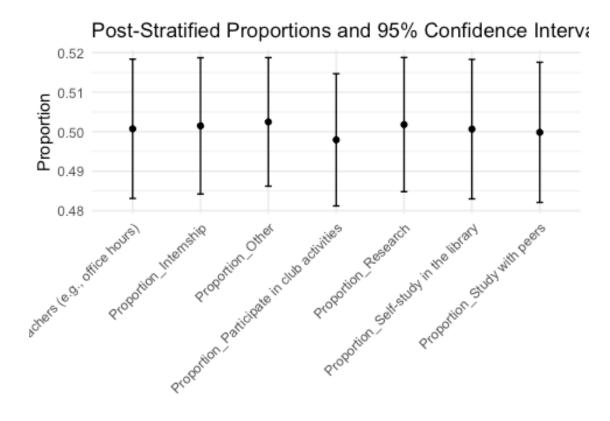
```
MLE estimation for population stratification by mean study time
# Create the study time category based on mean study time
mean study time <- mean(Flexibility$`Time of additional learning activities p</pre>
er week`, na.rm = TRUE)
Flexibility$study_time_category <- ifelse(</pre>
  Flexibility$`Time of additional learning activities per week` <= mean study</pre>
_time,
 "≤ mean",
  "> mean"
)
# Count occurrences in sample
n below mean <- sum(Flexibility$study_time_category == "≤ mean", na.rm = TRUE
)
n above mean <- sum(Flexibility$study time category == "> mean", na.rm = TRUE
n total <- n below mean + n above mean</pre>
cat("Sample counts:\n")
Sample counts:
cat("Mean study time:", mean study time, "hours per week\n")
Mean study time: 11.8642 hours per week
cat("≤ mean:", n_below_mean, "students\n")
≤ mean: 41 students
cat("> mean:", n_above_mean, "students\n")
> mean: 40 students
cat("Total sample:", n total, "students\n\n")
Total sample: 81 students
```

```
# Known population size
N population <- 18106
# Maximum Likelihood Estimation for the proportion
# For a binomial distribution, the MLE of p is simply the sample proportion
p mle <- n below mean / n total</pre>
# Calculate estimated population sizes for each stratum
N below mean <- round(N population * p mle)</pre>
N_above_mean <- N_population - N_below_mean
# Print results
cat("MLE Results:\n")
MLE Results:
cat("Estimated proportion in '≤ mean' category:", round(p mle, 4), "\n\n")
Estimated proportion in '≤ mean' category: 0.5062
cat("Estimated Population Sizes:\n")
Estimated Population Sizes:
cat("Students with study time ≤", mean study time, "hours per week:", N below
mean, "students\n")
Students with study time \leq 11.8642 hours per week: 9165 students
cat("Students with study time >", mean study time, "hours per week:", N above
_mean, "students\n")
Students with study time > 11.8642 hours per week: 8941 students
# Calculate standard error for the proportion
# Using the formula for binomial proportion SE adjusted for finite population
se_p <- sqrt((p_mle * (1 - p_mle)) / n_total) * sqrt((N_population - n_total))</pre>
/ (N population - 1))
# Calculate 95% confidence intervals for population counts
cat("\n95% Confidence Intervals:\n")
95% Confidence Intervals:
ci_lower_p <- max(0, p_mle - 1.96 * se_p)</pre>
ci_upper_p <- min(1, p_mle + 1.96 * se_p)</pre>
ci_lower_below <- round(N_population * ci_lower_p)</pre>
ci_upper_below <- round(N_population * ci_upper_p)</pre>
cat("Students with study time ≤", mean study time, "hours: [",
    ci_lower_below, ", ", ci_upper_below, "]\n", sep="")
```

```
Students with study time ≤11.8642hours: [7198, 11132]
cat("Students with study time >", mean_study_time, "hours: [",
    N_population - ci_upper_below, ", ", N_population - ci_lower_below, "]\n"
, sep="")
Students with study time >11.8642hours: [6974, 10908]
9165+8941 == 18106
[1] TRUE
Post-stratification estimate
# popoulation estimate by MLE
# ≤
N_1 <- 9165
# >
N_2 <- 8941
N < - N 1 + N 2
#
n<- 81
n 1 <- 41
n_2 <- 40
# Population and sample information
N 1 <- 9165
N 2 <- 8941
N < - N_1 + N_2
n <- 81
n 1 <- 41
n_2 <- 40
# Calculate population proportions
A_1 <- N_1 / N
A_2 <- N_2 / N
A_i <- c(A_1, A_2)
# Columns to analyze
columns_to_analyze <- c(</pre>
  "Self-study in the library",
  "Participate in club activities",
  "Study with peers",
  "Consult teachers (e.g., office hours)",
  "Internship",
  "Research",
  "Other"
)
```

```
# Calculate the proportion of 1s for each study_time_category in each column
proportions df <- Flexibility %>%
  group_by(study_time_category) %>%
  summarise(across(all of(columns to analyze), ~ sum(. == 1) / sum(Flexibilit
y[[cur_column()]] == 1), .names = "Proportion_{col}"))
# Initialize a results data frame
results <- data.frame(</pre>
  Variable = character(),
  Proportion = numeric(),
 ME = numeric(),
 Lower CI = numeric(),
  Upper CI = numeric()
)
# Iterate over each column in proportions_df (excluding the first column)
for (col name in colnames(proportions df)[-1]) {
  # Extract the proportion for the current column
  p <- proportions_df[[col_name]][1] # Assuming the first row contains the r</pre>
elevant proportion
  # Calculate post-stratified proportion
  p_{post} < A_1 * p + A_2 * (1 - p)
  # Calculate variances
  Var_1 <- p * (1 - p) / (n_1 - 1)
  Var_2 <- (1 - p) * (1 - (1 - p)) / (n_2 - 1)
 Var_i <- c(Var_1, Var_2)</pre>
  # Post-stratification variance
 Var_p_post <- (1 / n) * A_i %*% Var_i + (1 / n^2) * (1 - A_i) %*% Var_i - (
1 / N) * A_i %*% Var_i
  # Margin of Error (ME)
  ME <- 2 * sqrt(Var p post)</pre>
  # Confidence Interval
  Lower_CI <- p_post - ME
  Upper_CI <- p_post + ME</pre>
  # Append results to the results data frame
  results <- rbind(results, data.frame(</pre>
    Variable = col name,
    Proportion = p_post,
    ME = ME,
    Lower CI = Lower CI,
    Upper CI = Upper CI
  ))
}
```

```
# Print the results table
print(results)
                                          Variable Proportion
                                                                      ME
              Proportion_Self-study in the library 0.5006463 0.01765143
1
2
         Proportion_Participate in club activities 0.4979381 0.01673351
3
                       Proportion_Study with peers 0.4998328 0.01774208
4 Proportion_Consult teachers (e.g., office hours) 0.5007277 0.01762531
5
                             Proportion_Internship 0.5014728 0.01723815
                               Proportion_Research 0.5017959 0.01698411
6
7
                                  Proportion_Other 0.5024743 0.01626683
   Lower CI Upper CI
1 0.4829948 0.5182977
2 0.4812046 0.5146716
3 0.4820907 0.5175749
4 0.4831024 0.5183531
5 0.4842347 0.5187110
6 0.4848118 0.5187800
7 0.4862075 0.5187411
ggplot(results, aes(x = Variable, y = Proportion)) +
  geom_point() +
  geom_errorbar(aes(ymin = Lower_CI, ymax = Upper_CI), width = 0.1) +
  labs(title = "Post-Stratified Proportions and 95% Confidence Intervals",
       x = "Variable",
       y = "Proportion") +
  theme minimal() +
  theme(axis.text.x = element text(angle = 45, hjust = 1))
```



```
Variable
```

```
estimate the mean of "sum of kinds"
# Population and sample information
N 1 <- 9165
N_2 <- 8941
N < - N_1 + N_2
n <- 81
n 1 <- 41
n_2 <- 40
# Calculate population proportions
A_1 <- N_1 / N
A 2 <- N 2 / N
A_i <- c(A_1, A_2)
mean_df <- Flexibility %>%
  group_by(study_time_category) %>%
  summarise(
    Mean_Sum_of_kinds = mean(`Sum of kinds`, na.rm = TRUE),
    .groups = 'drop'
  )
```

```
mean_1 <- mean_df$Mean_Sum_of_kinds[1]</pre>
mean 2 <- mean df$Mean Sum of kinds[2]</pre>
mean_post <- A_1 * mean_1 + A_2 * mean_2</pre>
var 1 <- var(Flexibility$`Sum of kinds`[Flexibility$study time category == "<</pre>
mean"])
var_2 <- var(Flexibility$`Sum of kinds`[Flexibility$study_time_category == ">
mean"])
Var post <- (1 / n) * (A 1^2 * var 1 / n 1 + A 2^2 * var 2 / n 2)
ME <- 2 * sqrt(Var_post)</pre>
Lower CI <- mean post - ME
Upper_CI <- mean_post + ME</pre>
results <- data.frame(</pre>
 Mean_Post = mean_post,
 ME = ME,
 Lower_CI = Lower_CI,
 Upper_CI = Upper_CI
)
print(results)
 Mean Post
                    ME Lower_CI Upper_CI
1 2.735637 0.03056876 2.705068 2.766206
Comparison with SRS
library(dplyr)
library(ggplot2)
# Population and sample information
N 1 <- 9165
N 2 <- 8941
N < - N_1 + N_2
n <- 81
n_1 <- 41
n 2 <- 40
# Calculate population proportions
A_1 <- N_1 / N
A_2 <- N_2 / N
```

```
mean_df <- Flexibility %>%
  summarise(
    Mean Sum of kinds = mean(`Sum of kinds`, na.rm = TRUE)
  )
mean <- mean df$Mean Sum of kinds</pre>
var_SRS <- var(Flexibility$`Sum of kinds`, na.rm = TRUE)</pre>
Var_SRS <- (N - n) / N * var_SRS / n
ME_SRS <- 2 * sqrt(Var_SRS)</pre>
Lower_CI_SRS <- mean_post - ME_SRS
Upper_CI_SRS <- mean_post + ME_SRS</pre>
results SRS <- data.frame(</pre>
  Mean = mean,
 ME = ME_SRS,
 Lower CI = Lower CI SRS,
  Upper_CI = Upper_CI_SRS
)
print(results_SRS)
                   ME Lower_CI Upper_CI
      Mean
1 2.728395 0.2804889 2.455148 3.016126
```

## Acknowledgements

I would like to express my sincere gratitude to Dr. Haojin Zhou for his exceptional instruction in Survey Sampling. His teachings have truly illuminated the captivating and practical applications of statistics, revealing its profound impact and charm in real-world scenarios.

I am also deeply appreciative of the tireless efforts of the teaching assistants. Their guidance during tutorials and their availability during office hours have been invaluable in helping us navigate through the complexities of the course material.

Special thanks go to the first assignment, which provided me with the opportunity to delve into fascinating statistical literature such as "The Lady Tasting Tea." This book was so engaging that

I completed it in one go, and it has significantly broadened my understanding and appreciation of the field of statistics.

The subsequent three assignments have been equally beneficial, offering me ample opportunities to apply the knowledge I have acquired throughout the course. These exercises have not only reinforced my learning but also deepened my comprehension of the subject matter.

I am particularly grateful for the extended deadline for this report, which has been pushed back to June 7th. This additional time has allowed me to immerse myself in further reading and to engage in more thoughtful contemplation of various sampling methods. It has given me the chance to critically evaluate their appropriateness, effectiveness, and cost, thereby enriching my report content.

Lastly, I would like to say thanks to Dr. Haojin Zhou's PPT which has helped me to understand lots of concepts and summarize my notes as follows: https://yuuuulu.github.io/Math-s-interesting-things/aph103.html

#### XJTLU学生利用空余时间进行的学习活动 Availability and flexibility of part-time study options of XJTLU students ▲1. 您的性别 / Your Gender: 〇 A. 男 / Male 〇 B. 女 / Female \*2. 您的年级 / Your Academic Year 〇 A. 大一 / Freshman 〇 B. 大二 / Sophomore 〇 C. 大三 / Junior 〇 D. 大四 / Senior -3. (多选题 /Multiple Choice) 你利用空余时间学习的主要方式有哪些? /How do you primarily use your free time for learning? [多选题] □ A. 图书馆自习 / Self-study in the library B. 参加社团活动 / Participate in club activities □C. 和小伙伴一起学习 / Study with peers □D. 向老师请教 (office hour等) / Consult teachers (e.g., office hours) □E. 实习 / Internship □ F. 料研 / Researcl □G. 其他 / Other \*4. 你每周大概有多少小时的空余时间进行另外的学习活动?/How many hours of free time do you have per week for additional learning activities? (请填写数值 (如:15) / (Please enter a numerical value, e.g., 15) \*5. (多选题/Multiple Choice)在空余时间学习中,你注重的因素是?/ What factors do you prioritize in free-time learning? [多选题] □ A. 学习内容的趣味性 / Interest of the learning co □ B. 学习内容对未来就业的帮助 / Relevance to future career □ C. 学习的便利性(如线上随时随地学习) / Convenience (e.g., online learning) □ D. 学习的社交性(与同学互动交流) / Social Interaction (peer ca \*6. (多选题/Multiple Choice) 你认为影响你在空余时间学习效果的因素有哪些? /What factors affect your learning effectiveness in free time? [多远题] □A. 学习资源的质量(如课程内容、书籍质量) / Quality of resources (e.g., □ B. 个人时间管理能力 / Personal time management □ C. 学习环境(如周围环境安静程度) / Learning environment (e.g., guietness) □D. 周边人的影响(如同学的学习积极性) / Peer influence (e.g., classmates'

### **Appendix 2 – Questionnaire**

#### \*7. 你对学校目前提供的空余时间学习支持(如社团学习活动、图书馆资源等)的满意度? /How satisfied are you with the university's free-time learning support (e.g., club activities, library resources)?

〇 A. 非常满意 / Very satisfied

○ B. 满意 / Satisfied

○ C. 一般 / Neutral

○ D. 不满意 / Dissatisfied

○ E. 非常不满意 / Very dissatisfied

# Appendix 3 – Collected data

労働・         現代時間 Y         月間時間 Y         月間時間 Y         日間時間 Y         日間日日日日日日日日日日日日日日日日日日日日日日日日日日日日日日日日日日日		Concere	u uutu		
1         1	序号 -	提交答卷时间 ▼	所用时间▼	1. 您的性别 / Your Gender: ▼	2. 您的年级 / Your Academic Year: ▼
3         2025/5/17 16:29:34         489         B. S. / Female         B. S. / Sophomore           4         2025/5/17 16:29:54         599         B. S. / Female         B. S. / Sophomore           5         2025/5/17 16:32:53         569         A. B. / Male         B. S. / Sophomore           6         2025/5/17 16:32:53         569         A. B. / Male         B. S. / Sophomore           7         2025/5/17 16:35:14         679         B. S. / Female         B. S. / Sophomore           8         2025/5/17 16:36:22         529         B. S. / Female         B. S. / Sophomore           10         2025/5/17 16:36:22         629         B. S. / Female         B. S. / Sophomore           11         2025/5/17 16:30:29         6549         A. B. / Male         C. S. / Junior           12         2025/5/17 16:50:46         649         B. S. / Female         B. S. / Sophomore           13         2025/5/17 17:30:24         349         B. S. / Female         B. S. / Sophomore           14         2025/5/17 17:30:34         1199         B. S. / Female         B. S. / Sophomore           15         2025/5/17 17:30:34         349         B. S. / Female         B. S. / Sophomore           16         2025/5/17 17:30:35         329         B.	1	2025/5/17 16:04:43	76秒	B. 女 / Female	B. 大二 / Sophomore
A         2025/5/17 16:32:57         58%         B         5 X / Female         B         X / Sophomore           5         2025/5/17 16:32:07         43%         B         5 X / Female         B         X / Sophomore           6         2025/5/17 16:32:53         56%         A         B         5 X / Female         B         X / Sophomore           7         2025/5/17 16:36:59         97%         B         5 X / Female         B         X / Sophomore           8         2025/5/17 16:36:59         97%         B         S / Female         B         X / Sophomore           10         2025/5/17 16:32:53         56%         A         B         X / Female         B         X / Sophomore           11         2025/5/17 16:32:46         64%         B         S / Female         B         X / Sophomore           13         2025/5/17 16:32:46         54%         A         B         S / Female         B         X / Sophomore           14         2025/5/17 17:0:14         44%         B         S / Female         B         X / Sophomore           15         2025/5/17 17:0:13         78%         B         S / Female         B         X / Sophomore           14         2025/5/17 18:26	2	2025/5/17 16:07:58	35秒	B. 女 / Female	C. 大三 / Junior
5         2025/5/17 16:32:07         43P         B. S. / Female         B. S. / Female           6         2025/5/17 16:32:33         56P         A. J. / Male         B. S. / Female         B. S. / Female           7         2025/5/17 16:36:56         97P         B. S. / Female         B. S. / Female         B. S. / Female           8         2025/5/17 16:36:52         97P         B. S. / Female         B. S. / Female         C. S. / Junior           9         2025/5/17 16:36:22         65P         B. S. / Female         B. S. / Female         S. S. / Junior           11         2025/5/17 16:32:26         65P         A. J. / Male         B. S. / Female         B. S. / Sephomore           12         2025/5/17 16:32:47         119P         B. S. / Female         B. S. / Sephomore           13         2025/5/17 17:13:37         119P         B. S. / Female         B. S. / Sephomore           14         2025/5/17 17:13:47         72P         B. S. / Female         B. S. / Sephomore           15         2025/5/17 17:13:47         73P         B. S. / Female         B. S. / Sephomore           16         2025/5/17 17:13:61         37P         B. S. / Female         B. S. / Sephomore           16         2025/5/17 18:50:16         38P         B. S. / Female<	3	2025/5/17 16:28:35	49秒	B. 女 / Female	B. 大二 / Sophomore
6         2025/5/17 16:32:3         56%         A.B./ Male         B.A.Z./ Sophomore           7         2025/5/17 16:36:4         67%         B. & J./Earl         B. & Z./ Sophomore           8         2025/5/17 16:38:22         52%         B. & J./Earl         B. & Z./ Sophomore           10         2025/5/17 16:38:22         52%         B. & J./Earl         B. & Z./ Sophomore           11         2025/5/17 16:38:22         52%         B. & J./Earl         B. & Z./ Sophomore           11         2025/5/17 16:50:29         65%         A.B./ Male         B. & Z./ Sophomore           12         2025/5/17 16:50:29         65%         A.B./ Male         B. & Z./ Sophomore           13         2025/5/17 16:50:29         65%         A.B./ Male         B. & Z./ Sophomore           14         2025/5/17 16:50:29         65%         A.B./ Male         B. & Z./ Sophomore           15         2025/5/17 17:0:41         34%         B. & J./ Female         B. & Z./ Sophomore           16         2025/5/17 17:3:0:52         132%         B. & J./ Female         B. & Z./ Sophomore           16         2025/5/17 17:3:0:52         132%         B. & J./ Female         B. & Z./ Sophomore           12         2025/5/17 17:3:0:52         37%         B. &	4	2025/5/17 16:29:54	59秒	B. 女 / Female	B. 大二 / Sophomore
1         2         3         3	5	2025/5/17 16:32:07	43秒	B. 女 / Female	B. 大二 / Sophomore
B         S	6	2025/5/17 16:32:53	56秒	A. 男 / Male	B. 大二 / Sophomore
9         2025/5/17 16:38:22         52 by         B. by / Female         B. by / Female           10         2025/5/17 16:43:11         25 by         B. by / Female         A. the / Freshman           11         2025/5/17 16:49:54         61 by         B. by / Female         B. the / Sophomore           12         2025/5/17 16:50:29         65 by         A. By / Male         B. the / Sophomore           13         2025/5/17 16:52:46         54 by         A. By / Male         C. the / Sophomore           14         2025/5/17 16:52:47         11 9by         B. by / Female         B. the / Sophomore           15         2025/5/17 17:13:13         44 by         B. by / Female         B. the / Sophomore           16         2025/5/17 17:13:14         72 by         B. by / Female         B. the / Sophomore           17         2025/5/17 17:13:15         37 by         B. by / Female         B. the / Sophomore           18         2025/5/17 17:13:16         37 by         B. by / Female         B. the / Sophomore           12         2025/5/17 17:13:3         34 by         A. By / Male         C. the / Sophomore           12         2025/5/17 17:13:3         34 by         A. By / Male         A. the / Female           2025/5/17 22:3:0:64         7 S3 by	7	2025/5/17 16:35:14	67秒	B. 女 / Female	B. 大二 / Sophomore
Image: Section of the sectin of the section of the section	8	2025/5/17 16:36:59	97秒	B. 女 / Female	C. 大三 / Junior
11         2025/5/17 16:49:54         61b         B. S. / Female         B. S. / Sophomore           12         2025/5/17 16:50:29         65b         A. B. / Male         B. S. / Sophomore           13         2025/5/17 16:52:46         54b         A. B. / Male         C. S. / Sophomore           14         2025/5/17 16:53:47         119b         B. S. / Female         B. S. / Sophomore           15         2025/5/17 17:02:41         34b         B. S. / Female         B. S. / Sophomore           16         2025/5/17 17:02:41         34b         B. S. / Female         B. S. / Sophomore           17         2025/5/17 17:30:52         132b         B. S. / Female         B. S. / Sophomore           18         2025/5/17 17:30:52         132b         B. S. / Female         B. S. / Sophomore           20         2025/5/17 17:30:52         132b         B. S. / Female         B. S. / Sophomore           21         2025/5/17 17:30:52         132b         B. S. / Female         B. S. / Sophomore           21         2025/5/17 18:50:16         39b         B. S. / Female         B. S. / Sophomore           22         2025/5/17 22:51:4         47b         B. S. / Female         B. S. / Sophomore           23         2025/5/17 22:30:64         53b	9	2025/5/17 16:38:22	52秒	B. 女 / Female	B. 大二 / Sophomore
12         2025/5/17 16:50:29         66秒         A. B./ Male         B. A.T./ Sophomore           13         2025/5/17 16:53:47         119秒         B. b./ Female         C. A.T./ Junior           14         2025/5/17 16:53:47         119秒         B. b./ Female         B. A.T./ Sophomore           16         2025/5/17 17:02:41         34秒         B. b./ Female         B. A.T./ Sophomore           17         2025/5/17 17:03:52         132秒         B. b./ Female         B. A.T./ Sophomore           18         2025/5/17 17:36:52         132秒         B. b./ Female         B. A.T./ Sophomore           19         2025/5/17 17:36:55         37秒         B. b./ Female         B. A.T./ Sophomore           20         2025/5/17 18:26:07         143秒         B. b./ Female         B. A.T./ Sophomore           21         2025/5/17 18:26:07         143秒         B. b./ Female         B. A.T./ Sophomore           22         2025/5/17 18:26:01         34秒         A.B / Male         C. A.T./ Sophomore           23         2025/5/17 20:06:47         53秒         B. b./ Female         B. A.T./ Sophomore           24         2025/5/17 20:06:47         53秒         B. b./ Female         B. A.T./ Sophomore           25         2025/5/20 20:05:52         26秒	10	2025/5/17 16:43:11	25秒	B. 女 / Female	A. 大一 / Freshman
13         2025/5/17 16:52:4         54秒         A. 男 / Male         C. 大王 / Junior           14         2025/5/17 16:53:47         119秒         B. 女 / Female         C. 大王 / Junior           15         2025/5/17 17:02:41         34秒         B. 女 / Female         B. 大二 / Sophomore           16         2025/5/17 17:13:13         72秒         B. 女 / Female         B. 大二 / Sophomore           17         2025/5/17 17:30:52         132秒         B. 女 / Female         B. 大二 / Sophomore           18         2025/5/17 17:30:52         132秒         B. 女 / Female         B. 大二 / Sophomore           19         2025/5/17 17:30:52         132秒         B. 女 / Female         B. 大二 / Sophomore           20         2025/5/17 18:26:07         143秒         B. 女 / Female         B. 大二 / Sophomore           21         2025/5/17 18:26:07         143秒         B. 女 / Female         B. 大二 / Sophomore           22         2025/5/17 23:06:47         39秒         B. 女 / Female         B. 大二 / Sophomore           23         2025/5/17 23:06:47         53秒         B. 女 / Female         B. 大二 / Sophomore           24         2025/5/12 23:06:5         84秒         B. 女 / Female         B. 大二 / Sophomore           24         2025/5/20 23:06:4         27秒         B. 女 /	11	2025/5/17 16:49:54	61秒	B. 女 / Female	B. 大二 / Sophomore
14         2025/5/17 16:53:47         119秒         B. 5./ Female         C. 5.2./ Junior           15         2025/5/17 17:02:41         34秒         B. 5./ Female         B. 5.2./ Sophomore           16         2025/5/17 17:11:43         72秒         B. 5./ Female         B. 5.2./ Sophomore           17         2025/5/17 17:30:52         132秒         B. 5./ Female         B. 5.2./ Sophomore           18         2025/5/17 17:30:52         37秒         B. 5./ Female         B. 5.2./ Sophomore           20         2025/5/17 18:26:07         143秒         B. 5./ Female         B. 5.2./ Sophomore           21         2025/5/17 18:26:07         143秒         B. 5./ Female         B. 5.2./ Sophomore           21         2025/5/17 18:26:16         39秒         B. 5./ Female         B. 5.2./ Sophomore           22         2025/5/17 18:26:16         39秒         B. 5./ Female         B. 5.2./ Sophomore           23         2025/5/17 29:30:47         63秒         B. 5.2 / Female         B. 5.2./ Sophomore           24         2025/5/17 29:30:47         53秒         B. 5./ Female         B. 5.2./ Sophomore           27         2025/5/20 29:53:4         26秒         A. B./ Male         B. 5.2./ Sophomore           20         2025/5/20 29:54:43         27秒	12	2025/5/17 16:50:29	65秒	A. 男 / Male	B. 大二 / Sophomore
15         2025/5/17 17:02:41         34秒         B. b. x / Female         B. t. / Sophomore           16         2025/5/17 17:11:13         72秒         B. b. x / Female         B. t. / Sophomore           17         2025/5/17 17:19:18         46秒         B. b. x / Female         B. t. / Sophomore           18         2025/5/17 17:30:52         132秒         B. b. x / Female         B. t. / Sophomore           19         2025/5/17 18:26:07         143秒         B. b. x / Female         B. t. / Sophomore           20         2025/5/17 18:26:07         143秒         B. b. x / Female         B. t. / Sophomore           21         2025/5/17 18:26:07         143秒         B. b. x / Female         B. t. / Sophomore           22         2025/5/17 18:26:07         143秒         B. b. x / Female         B. t. / Sophomore           23         2025/5/17 18:26:07         143秒         B. b. x / Female         B. t. / Sophomore           24         2025/5/17 29:30:47         53秒         B. b. x / Female         B. t. / Sophomore           24         2025/5/20 29:53:4         26秒         A. B. / Male         A. t. / Freshman           26         2025/5/20 29:54:4         27秒         B. b. x / Female         B. t. / Sophomore           27         2025/5/20 29:54:52	13	2025/5/17 16:52:46	54秒	A. 男 / Male	C. 大三 / Junior
16         2025/5/17 17:11:34         72b         B. b. / Female         B. b. / Sphomore           17         2025/5/17 17:13:18         46b         B. b. / Female         B. b. / Sphomore           18         2025/5/17 17:30:52         132b         B. b. / Female         B. b. / Sphomore           19         2025/5/17 17:30:52         132b         B. b. / Female         B. b. / Sphomore           20         2025/5/17 18:50:6         37b         B. b. / Female         B. b. / Sphomore           21         2025/5/17 18:50:16         39b         B. b. / Female         B. b. / Sphomore           22         2025/5/17 18:50:16         39b         B. b. / Female         B. b. / Sphomore           22         2025/5/17 18:50:16         39b         B. b. / Female         B. b. / Sphomore           23         2025/5/17 22:51:4         47b         B. b. / Female         B. b. / Sphomore           24         2025/5/17 22:30:5         84b         B. b. / Female         B. b. / - / Freshman           26         2025/5/19 18:27:12         39b         A. B. / Male         B. b. / - / Freshman           28         2025/5/20 22:3:43         27b         B. b. / Female         B. b. / - / Freshman           30         2025/5/20 23:10:05         56b	14	2025/5/17 16:53:47	119秒	B. 女 / Female	C. 大三 / Junior
17         2025/5/17 17:19:18         4 6秒         B. 太 / Female         B. 太 / Sophomore           18         2025/5/17 17:30:52         132秒         B. 太 / Female         B. 太 / Sophomore           19         2025/5/17 17:30:52         132秒         B. 太 / Female         B. 太 / Sophomore           20         2025/5/17 18:50:16         39秒         B. 女 / Female         B. 太 / Sophomore           21         2025/5/17 18:50:16         39秒         B. 女 / Female         B. 太 / Sophomore           22         2025/5/17 18:50:16         39秒         B. 女 / Female         B. 太 / Sophomore           22         2025/5/17 19:17:33         34秒         A. B / Male         C. 大 / Sophomore           24         2025/5/17 22:39:05         84秒         B. 女 / Female         B. 大 / Sophomore           25         2025/5/17 23:06:47         53秒         B. 女 / Female         A. 大 / - / Freshman           26         2025/5/20 22:53:54         26秒         A. B / Male         A. 大 / Sophomore           27         2025/5/20 22:53:54         26秒         A. B / Male         D. 大 / Sophomore           38         2025/5/20 23:10:05         56秒         A. B / Male         B. 大 / Sophomore           33         2025/5/20 23:10:13         36秒         B. 女 / Female </td <td>15</td> <td>2025/5/17 17:02:41</td> <td>34秒</td> <td>B. 女 / Female</td> <td>B. 大二 / Sophomore</td>	15	2025/5/17 17:02:41	34秒	B. 女 / Female	B. 大二 / Sophomore
18         2025/5/17 17:30:52         132 b         B. b x/ Female         B. b x/ Female           19         2025/5/17 17:30:51         37 b         B. b x/ Female         B. b x/ Sophomore           20         2025/5/17 18:26:07         143 b         B. b x/ Female         B. b x/ Sophomore           21         2025/5/17 18:26:07         143 b         B. b x/ Female         B. b x/ Sophomore           21         2025/5/17 18:26:07         143 b         B. b x/ Female         B. b x/ Sophomore           22         2025/5/17 19:17:33         34 b         A. B / Male         C. b x/ Sophomore           23         2025/5/17 19:17:33         34 b         B. b x/ Female         B. b x/ Sophomore           24         2025/5/17 22:35:14         47 b         B. b x/ Female         B. b x/ Sophomore           25         2025/5/17 23:06:47         53 b         B. b x/ Female         B. b x/ Sophomore           26         2025/5/18:27:12         39 b         A. B / Male         A. b x/ Sophomore           27         2025/5/20 22:55:5         26 b         A. B / Male         D. b x / Sophomore           28         2025/5/20 23:01:24         17 b         B. b x / Female         B. b x / Sophomore           31         2025/5/20 23:01:05         56 b <td>16</td> <td>2025/5/17 17:11:34</td> <td>72秒</td> <td>B. 女 / Female</td> <td>B. 大二 / Sophomore</td>	16	2025/5/17 17:11:34	72秒	B. 女 / Female	B. 大二 / Sophomore
19         2025/5/17 17:36:15         37秒         B. 女 / Female         B. 大二 / Sophomore           20         2025/5/17 18:26:07         143秒         B. 女 / Female         B. 大二 / Sophomore           21         2025/5/17 18:26:07         143秒         B. 女 / Female         B. 大二 / Sophomore           22         2025/5/17 18:20:16         39秒         A. B. 女 / Female         B. 大二 / Sophomore           22         2025/5/17 19:17:33         34秒         A. B. / Male         C. 大三 / Junior           23         2025/5/17 22:25:14         47秒         B. 女 / Female         B. 大二 / Sophomore           24         2025/5/17 22:39:05         84秒         B. 女 / Female         B. 大二 / Sophomore           25         2025/5/17 23:06:47         53秒         B. 女 / Female         B. 大二 / Sophomore           26         2025/5/17 23:06:47         53秒         B. 女 / Female         A. 大一 / Freshman           26         2025/5/20 22:53:54         26秒         A. B. / Male         B. 大二 / Sophomore           27         2025/5/20 23:09:24         17秒         B. 女 / Female         D. 大四 / Senior           30         2025/5/20 23:01:03         56秒         A. B. / Male         B. 大二 / Sophomore           31         2025/5/20 23:01:03         56秒         A. B.	17	2025/5/17 17:19:18	46秒	B. 女 / Female	B. 大二 / Sophomore
20         2025/5/17 18:26:07         143秒         B. 女 / Female         B. 大二 / Sophomore           21         2025/5/17 18:20:16         39秒         B. 女 / Female         B. 大二 / Sophomore           22         2025/5/17 19:17:33         34秒         A. 男 / Male         C. 大三 / Junior           23         2025/5/17 22:25:14         47秒         B. 女 / Female         B. 大二 / Sophomore           24         2025/5/17 22:25:14         47秒         B. 女 / Female         B. 大二 / Sophomore           24         2025/5/17 22:39:05         84秒         B. 女 / Female         B. 大二 / Sophomore           25         2025/5/17 23:06:47         53秒         B. 女 / Female         B. 大二 / Sophomore           26         2025/5/19 18:27:12         39秒         A. 男 / Male         B. 大二 / Sophomore           27         2025/5/20 22:53:54         26秒         A. 男 / Male         D. 大四 / Senior           28         2025/5/20 23:09:24         17秒         B. 女 / Female         B. 大二 / Sophomore           31         2025/5/20 23:10:05         56秒         A. 男 / Male         B. 大二 / Sophomore           32         2025/5/20 23:10:10         36秒         B. 女 / Female         B. 大二 / Sophomore           33         2025/5/20 23:10:11         38秒         B. 女 / Female	18	2025/5/17 17:30:52	132秒	B. 女 / Female	B. 大二 / Sophomore
21         2025/5/17 18:50:16         39秒         B. 女 / Female         B. 大二 / Sophomore           22         2025/5/17 19:17:33         34秒         A. 男 / Male         C. 大三 / Junior           23         2025/5/17 22:25:14         47秒         B. 女 / Female         B. 大二 / Sophomore           24         2025/5/17 22:39:05         84秒         B. 女 / Female         B. 大二 / Sophomore           25         2025/5/17 23:06:47         53秒         B. 女 / Female         B. 大二 / Sophomore           26         2025/5/19 18:27:12         39秒         A. 男 / Male         B. 大二 / Sophomore           27         2025/5/20 22:53:54         26秒         A. 男 / Male         B. 大二 / Sophomore           28         2025/5/20 22:55:25         25秒         A. 男 / Male         D. 大四 / Senior           30         2025/5/20 23:09:24         17秒         B. 女 / Female         B. 大二 / Sophomore           31         2025/5/20 23:10:35         56秒         A. 男 / Male         B. 大二 / Sophomore           33         2025/5/20 23:10:35         56秒         A. 男 / Male         B. 大二 / Sophomore           34         2025/5/20 23:10:35         56秒         A. 男 / Male         B. 大二 / Sophomore           34         2025/5/20 23:10:35         66秒         B. 女 / Female	19	2025/5/17 17:36:15	37秒	B. 女 / Female	B. 大二 / Sophomore
22         2025/5/17 19:17:33         34秒         A.男/Male         C.大三/Junior           23         2025/5/17 22:25:14         47秒         B.女/Female         B.大二/Sophomore           24         2025/5/17 22:39:05         84秒         B.女/Female         B.大二/Sophomore           25         2025/5/17 23:06:47         53秒         B.女/Female         A.大一/Freshman           26         2025/5/19 18:27:12         39秒         A.男/Male         B.大二/Sophomore           27         2025/5/20 22:53:54         26秒         A.男/Male         D.大二/Freshman           28         2025/5/20 22:54:3         27秒         B.女/Female         D.大二/Sophomore           29         2025/5/20 23:09:4         17秒         B.女/Female         B.大二/Sophomore           31         2025/5/20 23:10:05         56秒         A.男/Male         B.大二/Sophomore           33         2025/5/20 23:10:05         56秒         A.男/Male         B.大二/Sophomore           34         2025/5/20 23:10:11         38秒         B.女/Female         B.大二/Sophomore           34         2025/5/20 23:10:12         36秒         A.男/Male         B.大二/Sophomore           35         2025/5/20 23:10:13         66秒         B.女/Female         B.大二/Sophomore           36	20	2025/5/17 18:26:07	143秒	B. 女 / Female	B. 大二 / Sophomore
23         2025/5/17 22:25:14         47秒         B. 女 / Female         B. 大二 / Sophomore           24         2025/5/17 22:39:05         84秒         B. 女 / Female         B. 大二 / Sophomore           25         2025/5/17 23:06:47         53秒         B. 女 / Female         A. 大一 / Freshman           26         2025/5/19 18:27:12         39秒         A. 男 / Male         B. 大二 / Sophomore           27         2025/5/20 22:53:54         26秒         A. 男 / Male         A. 大一 / Freshman           28         2025/5/20 22:53:55         25秒         A. 男 / Male         D. 大四 / Senior           29         2025/5/20 23:09:24         17秒         B. 女 / Female         B. 大二 / Sophomore           31         2025/5/20 23:10:05         56秒         A. 男 / Male         B. 大二 / Sophomore           33         2025/5/20 23:10:05         56秒         A. 男 / Male         B. 大二 / Sophomore           34         2025/5/20 23:10:11         38秒         B. 女 / Female         B. 大二 / Sophomore           35         2025/5/20 23:10:33         66秒         B. 女 / Female         B. 大二 / Sophomore           37         2025/5/20 23:11:51         44秒         B. 女 / Female         B. 大二 / Sophomore           38         2025/5/20 23:11:51         44秒         B. 女 / Female <td>21</td> <td>2025/5/17 18:50:16</td> <td>39秒</td> <td>B. 女 / Female</td> <td>B. 大二 / Sophomore</td>	21	2025/5/17 18:50:16	39秒	B. 女 / Female	B. 大二 / Sophomore
24         2025/5/17 22:39:05         84秒         B. 女 / Female         B. 大二 / Sophomore           25         2025/5/17 23:06:47         53秒         B. 女 / Female         A. 大一 / Freshman           26         2025/5/19 18:27:12         39秒         A. 男 / Male         B. 大二 / Sophomore           27         2025/5/20 22:53:54         26秒         A. 男 / Male         A. 大一 / Freshman           28         2025/5/20 22:53:55         25秒         A. 男 / Male         D. 大四 / Sophomore           29         2025/5/20 23:09:24         17秒         B. 女 / Female         D. 大四 / Sophomore           30         2025/5/20 23:09:24         17秒         B. 女 / Female         B. 大二 / Sophomore           31         2025/5/20 23:10:05         56秒         A. 男 / Male         B. 大二 / Sophomore           33         2025/5/20 23:10:11         38秒         B. 女 / Female         B. 大二 / Sophomore           34         2025/5/20 23:10:12         36秒         A. 男 / Male         B. 大二 / Sophomore           35         2025/5/20 23:10:33         66秒         B. 女 / Female         B. 大二 / Sophomore           36         2025/5/20 23:11:51         44秒         B. 女 / Female         B. 大二 / Sophomore           37         2025/5/20 23:11:52         33秒         B. 女 / Female	22	2025/5/17 19:17:33	34秒	A. 男 / Male	C. 大三 / Junior
25         2025/5/17 23:06:47         53秒         B. 女 / Female         A. 大一 / Freshman           26         2025/5/19 18:27:12         39秒         A. 男 / Male         B. 大二 / Sophomore           27         2025/5/20 22:53:54         26秒         A. 男 / Male         B. 大二 / Sophomore           28         2025/5/20 22:53:54         26秒         A. 男 / Male         A. 大一 / Freshman           28         2025/5/20 22:53:55         25秒         B. 女 / Female         C. 大三 / Junior           29         2025/5/20 23:09:24         17秒         B. 女 / Female         B. 大二 / Sophomore           30         2025/5/20 23:09:44         29秒         A. 男 / Male         B. 大二 / Sophomore           31         2025/5/20 23:10:05         56秒         A. 男 / Male         B. 大二 / Sophomore           33         2025/5/20 23:10:03         30秒         B. 女 / Female         B. 大二 / Sophomore           34         2025/5/20 23:10:11         38秒         B. 女 / Female         B. 大二 / Sophomore           35         2025/5/20 23:10:35         43秒         A. 男 / Male         B. 大二 / Sophomore           36         2025/5/20 23:11:51         44秒         B. 女 / Female         B. 大二 / Sophomore           37         2025/5/20 23:11:52         33秒         B. 女 / Female	23	2025/5/17 22:25:14	47秒	B. 女 / Female	B. 大二 / Sophomore
26         2025/5/19 18:27:12         39秒         A.男/Male         B.大二/Sophomore           27         2025/5/20 22:53:54         26秒         A.男/Male         A.大一/Freshman           28         2025/5/20 22:53:54         27秒         B.女/Female         C.大三/Junior           29         2025/5/20 22:55:25         25秒         A.男/Male         D.大四/Senior           30         2025/5/20 23:09:24         17秒         B.女/Female         B.大二/Sophomore           31         2025/5/20 23:09:44         29秒         A.男/Male         B.大二/Sophomore           32         2025/5/20 23:10:05         56秒         A.男/Male         B.大二/Sophomore           33         2025/5/20 23:10:05         56秒         B.女/Female         B.大二/Sophomore           34         2025/5/20 23:10:11         38秒         B.女/Female         B.大二/Sophomore           35         2025/5/20 23:10:12         36秒         A.男/Male         B.大二/Sophomore           36         2025/5/20 23:10:13         66秒         B.女/Female         B.大二/Sophomore           37         2025/5/20 23:11:51         44秒         B.女/Female         B.大二/Sophomore           38         2025/5/20 23:11:52         33秒         B.女/Female         B.大二/Sophomore           39	24	2025/5/17 22:39:05	84秒	B. 女 / Female	B. 大二 / Sophomore
27         2025/5/20 22:53:54         26秒         A.男/Male         A.大-/Freshman           28         2025/5/20 22:54:43         27秒         B.女/Female         C.大三/Junior           29         2025/5/20 22:55:25         25秒         A.男/Male         D.大四/Senior           30         2025/5/20 23:09:24         17秒         B.女/Female         B.大二/Sophomore           31         2025/5/20 23:09:44         29秒         A.男/Male         B.大二/Sophomore           32         2025/5/20 23:10:05         56秒         A.男/Male         B.大二/Sophomore           33         2025/5/20 23:10:08         30秒         B.女/Female         B.大二/Sophomore           34         2025/5/20 23:10:11         38秒         B.女/Female         B.大二/Sophomore           35         2025/5/20 23:10:12         36秒         A.男/Male         B.大二/Sophomore           36         2025/5/20 23:10:35         43秒         A.男/Male         B.大二/Sophomore           37         2025/5/20 23:11:51         44秒         B.女/Female         B.大二/Sophomore           38         2025/5/20 23:11:52         33秒         B.女/Female         B.大二/Sophomore           39         2025/5/20 23:11:52         33秒         B.女/Female         B.大二/Sophomore           39	25	2025/5/17 23:06:47	53秒	B. 女 / Female	A. 大一 / Freshman
28         2025/5/20 22:55:25         27秒         B. 女 / Female         C. 大三 / Junior           29         2025/5/20 22:55:25         25秒         A. 男 / Male         D. 大四 / Senior           30         2025/5/20 23:09:24         17秒         B. 女 / Female         B. 大二 / Sophomore           31         2025/5/20 23:09:24         29秒         A. 男 / Male         B. 大二 / Sophomore           32         2025/5/20 23:10:05         56秒         A. 男 / Male         B. 大二 / Sophomore           33         2025/5/20 23:10:08         30秒         B. 女 / Female         B. 大二 / Sophomore           34         2025/5/20 23:10:11         38秒         B. 女 / Female         B. 大二 / Sophomore           35         2025/5/20 23:10:12         36秒         A. 男 / Male         B. 大二 / Sophomore           36         2025/5/20 23:10:33         66秒         B. 女 / Female         B. 大二 / Sophomore           37         2025/5/20 23:11:51         44秒         B. 女 / Female         B. 大二 / Sophomore           39         2025/5/20 23:11:52         33秒         B. 女 / Female         B. 大二 / Sophomore           39         2025/5/20 23:11:59         83秒         B. 女 / Female         B. 大二 / Sophomore           40         2025/5/20 23:11:59         83秒         B. 女 / Female </td <td>26</td> <td>2025/5/19 18:27:12</td> <td>39秒</td> <td>A. 男 / Male</td> <td>B. 大二 / Sophomore</td>	26	2025/5/19 18:27:12	39秒	A. 男 / Male	B. 大二 / Sophomore
29         2025/5/20 22:55:25         25秒         A.男/Male         D.大四/Senior           30         2025/5/20 23:09:24         17秒         B.女/Female         B.大二/Sophomore           31         2025/5/20 23:09:24         29秒         A.男/Male         B.大二/Sophomore           31         2025/5/20 23:10:05         56秒         A.男/Male         B.大二/Sophomore           32         2025/5/20 23:10:08         30秒         B.女/Female         B.大二/Sophomore           34         2025/5/20 23:10:11         38秒         B.女/Female         B.大二/Sophomore           35         2025/5/20 23:10:12         36秒         A.男/Male         B.大二/Sophomore           36         2025/5/20 23:10:3         66秒         B.女/Female         B.大二/Sophomore           37         2025/5/20 23:10:35         43秒         A.男/Male         B.大二/Sophomore           38         2025/5/20 23:11:51         44秒         B.女/Female         B.大二/Sophomore           39         2025/5/20 23:11:52         33秒         B.女/Female         B.大二/Sophomore           39         2025/5/20 23:11:52         33秒         B.女/Female         B.大二/Sophomore           40         2025/5/20 23:11:59         83秒         B.女/Female         B.大二/Sophomore	27	2025/5/20 22:53:54	26秒	A. 男 / Male	A. 大一 / Freshman
30         2025/5/20 23:09:24         177b         B. 女 / Female         B. 大二 / Sophomore           31         2025/5/20 23:09:44         2940         A. 男 / Male         B. 大二 / Sophomore           32         2025/5/20 23:10:05         5640         A. 男 / Male         B. 大二 / Sophomore           33         2025/5/20 23:10:08         3040         B. 女 / Female         B. 大二 / Sophomore           34         2025/5/20 23:10:11         3840         B. 女 / Female         B. 大二 / Sophomore           35         2025/5/20 23:10:12         3640         A. 男 / Male         B. 大二 / Sophomore           36         2025/5/20 23:10:33         6640         B. 女 / Female         B. 大二 / Sophomore           37         2025/5/20 23:11:51         4440         B. 女 / Female         B. 大二 / Sophomore           39         2025/5/20 23:11:52         3340         B. 女 / Female         B. 大二 / Sophomore           40         2025/5/20 23:11:59         8340         B. 女 / Female         B. 大二 / Sophomore	28	2025/5/20 22:54:43	27秒	B. 女 / Female	C. 大三 / Junior
31         2025/5/20 23:09:44         29秒         A.男/Male         B.大二/Sophomore           32         2025/5/20 23:10:05         56秒         A.男/Male         B.大二/Sophomore           33         2025/5/20 23:10:08         30秒         B.女/Female         B.大二/Sophomore           34         2025/5/20 23:10:11         38秒         B.女/Female         B.大二/Sophomore           35         2025/5/20 23:10:12         36秒         A.男/Male         B.大二/Sophomore           36         2025/5/20 23:10:33         66秒         B.女/Female         B.大二/Sophomore           37         2025/5/20 23:11:51         44秒         B.女/Female         B.大二/Sophomore           39         2025/5/20 23:11:52         33秒         B.女/Female         B.大二/Sophomore           40         2025/5/20 23:11:59         83秒         B.女/Female         B.大二/Sophomore	29	2025/5/20 22:55:25	25秒	A. 男 / Male	D. 大四 / Senior
32         2025/5/20 23:10:05         56秒         A. 男 / Male         B. 大二 / Sophomore           33         2025/5/20 23:10:08         30秒         B. 女 / Female         B. 大二 / Sophomore           34         2025/5/20 23:10:11         38秒         B. 女 / Female         B. 大二 / Sophomore           35         2025/5/20 23:10:12         36秒         A. 男 / Male         B. 大二 / Sophomore           36         2025/5/20 23:10:33         66秒         B. 女 / Female         B. 大二 / Sophomore           37         2025/5/20 23:10:35         43秒         A. 男 / Male         B. 大二 / Sophomore           38         2025/5/20 23:11:51         44秒         B. 女 / Female         B. 大二 / Sophomore           39         2025/5/20 23:11:52         33秒         B. 女 / Female         B. 大二 / Sophomore           40         2025/5/20 23:11:59         83秒         B. 女 / Female         B. 大二 / Sophomore	30	2025/5/20 23:09:24	17秒	B. 女 / Female	B. 大二 / Sophomore
33         2025/5/20 23:10:08         30秒         B. 女 / Female         B. 大二 / Sophomore           34         2025/5/20 23:10:11         38秒         B. 女 / Female         B. 大二 / Sophomore           35         2025/5/20 23:10:12         36秒         A. 男 / Male         B. 大二 / Sophomore           36         2025/5/20 23:10:33         66秒         B. 女 / Female         B. 大二 / Sophomore           37         2025/5/20 23:10:35         43秒         A. 男 / Male         B. 大二 / Sophomore           38         2025/5/20 23:11:51         44秒         B. 女 / Female         B. 大二 / Sophomore           39         2025/5/20 23:11:52         33秒         B. 女 / Female         B. 大二 / Sophomore           40         2025/5/20 23:11:59         83秒         B. 女 / Female         B. 大二 / Sophomore	31	2025/5/20 23:09:44	29秒	A. 男 / Male	B. 大二 / Sophomore
34     2025/5/20 23:10:11     38秒     B. 女 / Female     B. 大二 / Sophomore       35     2025/5/20 23:10:12     36秒     A. 男 / Male     B. 大二 / Sophomore       36     2025/5/20 23:10:33     66秒     B. 女 / Female     B. 大二 / Sophomore       37     2025/5/20 23:10:35     43秒     A. 男 / Male     B. 大二 / Sophomore       38     2025/5/20 23:11:51     44秒     B. 女 / Female     B. 大二 / Sophomore       39     2025/5/20 23:11:52     33秒     B. 女 / Female     B. 大二 / Sophomore       40     2025/5/20 23:11:59     83秒     B. 女 / Female     B. 大二 / Sophomore	32	2025/5/20 23:10:05	56秒	A. 男 / Male	B. 大二 / Sophomore
35         2025/5/20 23:10:12         36秒         A. 男 / Male         B. 大二 / Sophomore           36         2025/5/20 23:10:33         66秒         B. 女 / Female         B. 大二 / Sophomore           37         2025/5/20 23:10:35         43秒         A. 男 / Male         B. 大二 / Sophomore           38         2025/5/20 23:11:51         44秒         B. 女 / Female         B. 大二 / Sophomore           39         2025/5/20 23:11:52         33秒         B. 女 / Female         B. 大二 / Sophomore           40         2025/5/20 23:11:59         83秒         B. 女 / Female         B. 大二 / Sophomore	33	2025/5/20 23:10:08	30秒	B. 女 / Female	B. 大二 / Sophomore
36         2025/5/20 23:10:33         66秒         B. 女 / Female         B. 大二 / Sophomore           37         2025/5/20 23:10:35         43秒         A. 男 / Male         B. 大二 / Sophomore           38         2025/5/20 23:11:51         44秒         B. 女 / Female         B. 大二 / Sophomore           39         2025/5/20 23:11:52         33秒         B. 女 / Female         B. 大二 / Sophomore           40         2025/5/20 23:11:59         83秒         B. 女 / Female         B. 大二 / Sophomore	34	2025/5/20 23:10:11	38秒	B. 女 / Female	B. 大二 / Sophomore
37         2025/5/20 23:10:35         43秒         A. 男 / Male         B. 大二 / Sophomore           38         2025/5/20 23:11:51         44秒         B. 女 / Female         B. 大二 / Sophomore           39         2025/5/20 23:11:52         33秒         B. 女 / Female         B. 大二 / Sophomore           40         2025/5/20 23:11:59         83秒         B. 女 / Female         B. 大二 / Sophomore	35	2025/5/20 23:10:12	36秒	A. 男 / Male	B. 大二 / Sophomore
38         2025/5/20 23:11:51         44秒         B. 女 / Female         B. 大二 / Sophomore           39         2025/5/20 23:11:52         33秒         B. 女 / Female         B. 大二 / Sophomore           40         2025/5/20 23:11:59         83秒         B. 女 / Female         B. 大二 / Sophomore	36	2025/5/20 23:10:33	66秒	B. 女 / Female	B. 大二 / Sophomore
39         2025/5/20 23:11:52         33秒         B. 女 / Female         B. 大二 / Sophomore           40         2025/5/20 23:11:59         83秒         B. 女 / Female         B. 大二 / Sophomore	37	2025/5/20 23:10:35	43秒	A. 男 / Male	B. 大二 / Sophomore
40         2025/5/20 23:11:59         83秒         B. 女 / Female         B. 大二 / Sophomore	38	2025/5/20 23:11:51	44秒	B. 女 / Female	B. 大二 / Sophomore
	39	2025/5/20 23:11:52	33秒	B. 女 / Female	B. 大二 / Sophomore
41 2025/5/20 23:12:03 28秒 B. 女 / Female B. 大二 / Sophomore	40	2025/5/20 23:11:59	83秒	B. 女 / Female	B. 大二 / Sophomore
	41	2025/5/20 23:12:03	28秒	B. 女 / Female	B. 大二 / Sophomore

<ol> <li>(多透着/huitiple Choice) 你将用空余时背华习的主要方式有哪些? How do you primarily use your free time for learning? T</li> <li>A.图传馆日习 / Self-study in the library [ D. 向老筠建数 (office hour%) / Consult teachers (e.g., office hours) [ F. 科研 / Research [ G. 其他 / Other</li> </ol>	4. 你每周大概有多少小吗的空余时间进行另外的学习活动//How many hours of free time do you have per week for additional learning activities? (讀描写数值 (如:15) / (Piec 15
A 图书馆自马 / Self-study in the library I 形 科研 / Research	10
B. 参加社团活动 / Participate in club activities [ C. 积小校伴一起学习 / Study with peers ] F. 利禄 / Research A. 图书馆自习 / Sef-study in the Ibrary [ F. 税捐 / Research	5
A. 股子馆自习 / Self-study in the library [ C. 和小伙伴一能学习 / Study with peers ] D. 符書価値数 (office hour得) / Consult teachers (e.g., office hours)	20
A. 图书馆自习 / Setf-study in the library 目. 参加社团活动 / Participate in club activities	8
A. 图号馆自习 / Self-study in the library   C. 和小伙伴一起学习 / Study with peers   E. 实习 / Internation	15
A. 图书馆自习 / Self-study in the fibrary [ C. 和) 代好一起学习 / Study with peers [ D. 向老男旗数 (office hour帝) / Consult Intechters (e.g., office houre) [ F. 科研 / Research	17
A. 图书馆自习/Self-shudy in the locary [ C. 和小伙伴 - 起学习 / Study with peers [ D. 向地原油酸 (office hours) / Consult teachers (a.g., office hours) [ E. 实习 / International (A. 图书馆自习 / Self-shudy in the locary) [ C. 和小伙伴 - 起学习 / Study with peers [ D. 向地原油酸 (office hours) / Consult teachers (a.g., office hours) [ E. 实习 / International (A. 图书馆自习 / Self-shudy in the locary ] C. 和小伙伴 - 起学习 / Study with peers [ D. 向地原油酸 (office hours) / Consult teachers (a.g., office hours) [ E. 实习 / International (A. 图书馆自习 / Self-shudy (a.g., office hours) [ E. 实习 / International (A. Research	14
A. 图书馆自习 / Self-study in the library	20
A. 图书馆自习 / Self-study in the library   D. 內布所導致(office hour等) / Consult teachers (e.g., office hours)   E. 实习 / Internship   F. 科研 / Research   G. 其他 / Other	25
A. 图形馆自习 / Self-study in the Brany   C. 和小伙伴一起学习 / Study with pares   D. 内老街清教(office hour等) / Consult teachers (e.g., office hours)   F. 科研 / Research C. 和小伙伴一起学习 / Study with pares   D. 内老街清教(office hour等) / Consult teachers (e.g., office hours)	42
C. 和小时午一般学习 / Study with peers   D. 问受时建筑(critice incurrity) / Consult bachens (e.g., othice incurrity)   F. 和研 / Research A. 图书馆自习 / Self-study in the library   C. 和小伙伴一起学习 / Study with peers   D. 向老的课载(critice incurrity) / Consult bachens (e.g., othice incurrity)   F. 科研 / Research	20
A. 图作馆自习 / Self-study in the library I F. 和研 / Research	28-30/\8]
A. 图书馆自习 / Self-study in the library I.B. 参加社团活动 / Participate in club activities [ E. 实习 / Internship	5
A. 田书馆自马 / Self-study in the library 1 // 积研 / Research	15
A. 医书馆自习 / Self-study in the library [10. 向老师请教(office hour得) / Consult teachers (e.g., office hours) [F. 科研 / Research A. 医书馆自习 / Self-study in the library [F. 科研 / Research	8 20
A. 图书馆自习 / Self-study in the library [ P. 中容群语教 (office hours) / / Consult teachers (e.g., office hours)	10
C. 和小伙伴一起学习 / Study with peers [ D. 向老师清教(office hour得) / Consult teachers (e.g., office hours) [ F. 科研 / Research	12
A. 图书馆自习 / Self-study in the Ibrary I D. 向老师请数(office hour等) / Consult teachers (e.g., office hours) I F. 科研 / Research	4
A. 图书馆自习 / Self-study in the library I C. 和小伙伴一起学习 / Study with peers I D. 向老的清教(office hour物) / Consult teachers (e.g., office hours) I F. 科研 / Research	13
A 面形信白习 / Self-study in the library 18. 参加社団活动 / Participate in club activities [C. 和小校伴一起学习 / Study with peers [D. 内包研講教(office hour语) / Consult teachers (e.g., office houra) A 图形馆白习 / Self-study in the library	8
A. 图书馆自习 / Self-study in the Ibrary [ B. 参加社团活动 / Participate in Cub activities ] C. 和小伙伴一起学习 / Study with peers	20
D. 向客所请教(office hour等) / Consult teachers (e.g., office hours)   F. 杨智 / Besearch	10
A. 图书馆自习 / Self-study in the library   E. 实习 / Internship	5
A. 图书馆自习 / Self-study in the library	10
B. 参加性認语说/Participate in club activities [C. 和小伙伴一起学习 / Study with peers D. 向老明课题(office hour语) / Consult Heachers (k.g., office hours) [G. 其他/Offine	12
D. (包密研集数 (office hour的) / Consult teachers (k.g., office hours) I G. 政治 / Other A. 图书版台马 / Self-study in the library	15 20
A. 图书馆自习 / Self-study in the Ibrary 1 C. 和小校评一起学习 / Study with peers	3
A. 图书馆自习 / Self-study in the library   E. 实习 / Internship   F. 科研 / Research	21
A. 图书馆自习 / Self-study in the library   G. 其他 / Other	49
C. 和小伙伴一提华习 / Study with peers A. 图书馆自习 / Seif-study in the litnary	10 48
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A. 图书馆自习 / Self-study in the library I C. 和小伙伴一起学习 / Study with peers I D. 向老师请教(office hour等) / Consult teachers (e.g., office hours) I E. 实习 / Internship I F. 科研 / Research	15
B. 学习内容对未来就业的帮助 / Relevance to	
B. 学习内容对未来就业的帮助 / Relevance to	future career
B. 学习内容对未来就业的帮助 / Relevance to future career   D. 学习的社交性(与同	<sup>4</sup> 互动交流) / Social interaction (peer communication)
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	a时随地学习) / Convenience (e.g., online learning)
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6. (多這題/Multiple Choice) 你认为影响存在空余时间学习效果的图案有哪些? What factors affect your learning effectiveness in free time? ▼
A 学习资源的质量(如道程内容、书籍质量)/ Quality of resources (e.g., ocurse materials, books) [ B. 个人时间管理能力 / Personal time management [ C. 学习环境(如周围环境安静程度) / Learning environment (e.g., quietness)
A.学习资源的质量(如课程内容、书籍质量) / Quality of resources (e.g., course materials, books) [ D. 周边人的影响(如同学的学习积极性) / Peer influence (e.g., classmates' motivation)
A.学习资源的质量(如源理内容,书籍质量)/Quality of resources (e.g., course materials, books)   B. 个人时间管理能力 / Personal time management   C.学习环境(如周国环境安静程度) / Learning environment (e.g., quietness)   D. 两边人的影响(如同学的学习形极性) / Peri Influence (e.g., classmates' motivation)
A.学习资源的质量(如课程内容、书籍质量) / Quality of resources (e.g., course materials, books) [ B. 个人时间管理能力 / Personal time management [ C. 学习环境(如同国环境安静程度) / Learning environment (e.g., quietness) [ D. 周边人的影响(如同学的学习积极性) / Per influence (e.g., classmatter' motivation)
A.学习资源的装置(如课程内容、书籍质量) / Quality of resources (e.g., course materials, books) [ B. 个人时间管理能力 / Personal time management [ C. 学习环境 (如同图环境安静程度) / Learning environment (e.g., quietness) [ D. 周边人的影响(如同学的学习积极性) / Per influence (e.g., classmatter' motivation)
A 学习资源的质量(如课程内容、书籍质量) / Quality of resources (e.g., course materials, books)   B. 个人时间管理能力 / Personal time management   C. 学习环境(如周围环境安静程度) / Learning environment (e.g., quietness)
A 学习资源的质量(如课程内容、书籍质量)/Quality of resources (e.g., course materials, books)   B. 个人时间管理能力 / Personal time management   C. 学习环境(如周围环境安静程度) / Learning environment (e.g., quietness)   D. 周边人的影响(如同学的学习积极性) / Peer influence (e.g., classmatter' motivation
A 学习资源的质量(如谐程内容、书籍质量) / Quality of resources (e.g., course materials, books) [ B. 个人时向管理能力 / Personal time management [ C. 学习环境(如周国环境安静程度) / Learning environment (e.g., quietness)
A.学习资源的质量(如课程内容,书籍质量)/Quality of resources (e.g., oourse materials, books)   B. 个人时间管理能力 / Personal time management   C.学习环境(如周围环境安静程度) / Learning environment (e.g., quietness)   D. 周边人的影响(如同学的学习积极性) / Peri Influence (e.g., classmates' motivation
A 学习资源的质量(如课程内容、书籍质量)(Quality of resources (e.g., oourse materials, books)   B. 个人时间管理能力 / Personal time management   C. 学习环境(如周围环境安静程度) / Learning environment (e.g., quietnessa   D. 周边人的影响(如同学的学习积吸性) / Peer Influence (e.g., classmatter) motivation
A.学习资源的质量(如课程内容、书籍质量) / Quality of resources (e.g., course materials, books) [ B. 个人时间管理能力 / Personal time management ] C. 学习环境(如周围环境安静程度) / Learning environment (e.g., quietness)
A.学习资源的质量(如课程内容、书籍质量) / Quality of resources (e.g., course materials, books)   B. 个人时间管理能力 / Personal time management   C. 学习环境(如周围环境安静程度) / Learning environment (e.g., quietness)
B. 个人时间管理能力 / Personal time management [ C. 学习环境(如周面环境安静程度) / Learning environment (e.g., quietness) [ D. 周边人约影响(如同学约平规程性) / Peer Influence (e.g., classmates' motivation) ] E. 其他 / Other
8. 个人时间管理能力 / Personal time management [ C. 学习环境(如用阻环境交种程度) / Learning environment (e.g., quietness) [ D. 用边人的影响(如同学为我很性) / Peer influence (e.g., classmates' motivation)
A 学习资源的质量(如课程内容,书籍质量)/ Quality of resources (e.g., course materials, books)   B. 个人时间管理能力 / Personal time management   C. 学习环境(如同环境安静程度) / Learning environment (e.g., quietness)   D. 周边人的影响(如同学的学习系吸性) / Peer influence (e.g., classmates' motivation
A.学习资源的质量(如课程内容、书籍质量)/ Quality of resources (e.g., course materials, books) [ B.个人时间管理能力 / Personal time management [ C. 学习环境(如同相环线支持程度) / Learning environment (e.g., quietness)
A.学习资源的质量(如课程外容,书籍质量)/ Quality of resources (e.g., course materials, books) [ B. 个人时间管理能力 / Personal time management [ C. 学习环境(如同图环境安静程度) / Learning environment (e.g., quietness) [ D. 周边人的影响(如同学的学习积极性) / Peer influence (e.g., classmates' motivation
A.学习资源的质量(如课程内容、书籍质量) / Quality of resources (e.g., course materials, books) [ B.个人引向管理能力 / Personal time management [ C. 学习环境(如同相环境交种程度) / Learning environment (e.g., quietness)
A.学习资源的质量(如课程内容、书籍质量) / Quality of insources (e.g., course materials, books) [ B. 个人时间管理能力 / Personal time management [ C. 学习环境(如用田环境交替程度) / Learning environment (e.g., quietness)
A.学习资源的质量(如课程内容,书籍质量)/ Quality of resources (e.g., course materials, books) [ C. 学习环境(如周围环境安静程度)/ Learning environment (e.g., quietness) [ E. 其他 / Other
A.学习资源的质量(如课程内容、书籍质量)/ Cuality of resources (e.g., course materials, books) [ B.个人刻同管理能力 / Personal time management [ C. 学习环境(如同图环线交替程度) / Learning environment (e.g., quietness)
B. 个人影响管理能力 / Personal time management   C. 学习环境(如周围环境安静程度) / Learning environment (e.g., quietness)   D. 周边人纷影得(如同学终学习积极性) / Peer influence (e.g., classmates' motivation)
A.学习资源的质量(如课程内容,书籍质量)/ Quality of resources (e.g., course materials, books)   B. 个人时间管理能力 / Personal time management   C. 学习环境(如图环境安静程度) / Learning environment (e.g., quietness)   D. 周边人的影响(如同学的学习获受性) / Peer influence (e.g., classmattes' motivation
B. 个人时间管理能力 / Personal time management [ C. 学习环境(如周围环境安静程图) / Learning environment (e.g., quietness)
A 学习资源的质量(如谐程约容、书稿质量) / Quality of resources (e.g., course materials, books)   B. 个人时间被管徽力 / Personal time management   C. 学习环境(如用环境安静程度) / Learning environment (e.g., quietness)   D. 周边人的影响(如同学的学习顶级性) / Peer influence (e.g., classmates' motivation
A.学习贡派的质量(如该程内容,书籍质量)/ Quality of resources (e.g., course materials, books) [ B. 个人时间管理能力 / Personal time management [ C. 学习环境(如周环境安静程度) / Learning environment (e.g., quietness) [ D. 周边人的影响(如同学的学习积极性) / Peer influence (e.g., classmattes' motivation
A. 学习资源的质量(如课程内容、书籍质量) / Quality of resources (e.g., course materials, books)
B. 个人时间管理能力 / Personal time management [ D. 周边人的影响(如同学约学习积极性) / Peer influence (e.g., classmates' motivation)
A 学习资源的质量(如课程内容、书籍质量) / Quality of resources (e.g., course materials, books)   C. 学习环境(如周围环境交神程度) / Learning environment (e.g., quietness)
B. 个人时间被理能力 / Personal time management
A. 学习资源的质量(如课程内容、书稿质量) / Quality of resources (e.g., course materials, books)   B. 个人时间管理能力 / Personal time management
A. 学习资源的质量(如课程内容,书籍质量)/ Quality of resources (e.g., course materials, books)
A、学习资源的质量(如课程内容、书籍质量)/ Quality of resources (e.g., course materials, books) [ D. 周边人的影响(如同学约平习积极性) / Peer Influence (e.g., classmates' motivation)
A.学习资源的质量(如课程内容,书籍质量)/ Quality of resources (e.g., course materials, books)   B. 个人封闭管理能力 / Personal time management   C. 学习环境(如图环境安静程度) / Learning environment (e.g., quietness)   D. 周边人的影响(如同学的学习获受性) / Peer influence (e.g., classmattes' motivation
A.学习资源的质量(如读程内容、书籍质量) / Quality of resources (e.g., course materials, books) [B. 个人时向管理能力 / Personal time management [C.学习环境(如周国环境空静程度) / Learning environment (e.g., quietness) ] D. 周边人的影响(如同学的学习积极性) / Peer Influence (e.g., classmates' motivation
A.学习资源的质量(如译用分容,书籍质量) / Quality of resources (e.g., course materials, books) [ B. 个人时间管理能力 / Personal time management ] C.学习环境(如用限环境安静程度) / Learning environment (e.g., quietness)
A.学习资源的质量(如课程内容,书题质量) / Quality of resources (e.g., course materials, books) [ B. 个人时间管理能力 / Personal time management ] C.学习环境(如用图环境安静程度) / Learning environment (e.g., quietness)
- A.学习资源的质量(如源程内容、书籍质量) / Quality of resources (e.g., course materials, books) [B. 个人封闭管理能力 / Personal Itme management [C.学习环境(如周围环境支撑程度) / Learning environment (e.g., quietness) [D. 用边人的影响(如同学的学习积极性) / Peer Influence (e.g., classmatter' motivation
B. 个人时间管理能力 / Personal time management [ C. 学习环境(如周围环境安静程度) / Learning environment (e.g., quietness) ] D. 周边人的影响(如同学纳平习积极性) / Peer influence (e.g., classmates' motivation)

B.个人財尚管理能力/Personal time management [C.学习环境 (如周国环境安静程度) / Learning environment (e.g., quietness) [D. 用边人動影樂 (如同学的学习积极性) / Peer Influence (e.g., classmates' motivation)
A 学习资源的质量 (如课程内容, 书籍质量) / Quality of resources (e.g., ocurse materials, books) [B. 个人財尚管理能力/Personal time management [C.学习环境 (如周国环境安静程度) / Learning environment (e.g., quietness) [D. 用边人的影樂 (如同学的学习积极性) / Peer Influence (e.g., classmates' motivation)
A 学习资源的质量 (如课程内容, 书籍质量) / Quality of resources (e.g., ocurse materials, books) [B. 个人財尚管理能力/Personal time management [C.学习环境 (如周国环境安静程度) / Learning environment (e.g., quietness) [D. 用边人的影樂 (如同学的学习积极性) / Peer Influence (e.g., classmates' motivation)

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7. 你对学校目前提供的空余时间学习支持(如社团学习活动、图书馆资源等)的满意度? /How satisfied are you with the university's free-time learning support	(e.g., club activities, library resources)?
B. 满意 / Satisfied	
C. 一般 / Neutral	
B. 满意 / Satisfied	
C. 一般 / Neutral	
B. 满意 / Satisfied	
C. 一般 / Neutral	
B. 满意 / Satisfied	
B. 满意 / Satisfied	
B. 满意 / Satisfied	
E. 非常不满意 / Very dissatisfied	
B. 满意 / Satisfied	
B. 满意 / Satisfied	
C. 一般 / Neutral	
D. 不满意 / Dissatisfied	
C. 一般 / Neutral	
A. 非常满意 / Very satisfied	
B. 满意 / Satisfied	
B. 满意 / Satisfied	
B. 满意 / Satisfied	
C. 一般 / Neutral	
B. 满意 / Satisfied	
C. 一般 / Neutral	
C. 一般 / Neutral	
C. 一般 / Neutral	
A. 非常满意 / Very satisfied	
A. 非常满意 / Very satisfied	
B. 满意 / Satisfied	
C. 一般 / Neutral	
A. 非常满意 / Very satisfied	
A. 非常满意 / Very satisfied	
C. 一般 / Neutral	
B. 满意 / Satisfied	
C. 一般 / Neutral	
C. 一般 / Neutral	
A. 非常满意 / Very satisfied	

42	2025/5/20 23:15:54	41秒	B. 女 / Female	B. 大二 / Sophomore
43	2025/5/20 23:17:03	39秒	B. 女 / Female	B. 大二 / Sophomore
44	2025/5/20 23:17:25	58秒	A. 男 / Male	B. 大二 / Sophomore
45	2025/5/20 23:17:56	25秒	B. 女 / Female	B. 大二 / Sophomore
46	2025/5/20 23:19:54	33秒	B. 女 / Female	B. 大二 / Sophomore
47	2025/5/20 23:20:58	56秒	B. 女 / Female	B. 大二 / Sophomore
48	2025/5/20 23:21:10	23秒	B. 女 / Female	B. 大二 / Sophomore
49	2025/5/20 23:21:38	79秒	A. 男 / Male	B. 大二 / Sophomore
50	2025/5/20 23:22:33	188秒	A. 男 / Male	B. 大二 / Sophomore
51	2025/5/20 23:35:29	35秒	B. 女 / Female	B. 大二 / Sophomore
52	2025/5/20 23:39:23	48秒	A. 男 / Male	B. 大二 / Sophomore
53	2025/5/20 23:40:19	28秒	A. 男 / Male	B. 大二 / Sophomore
54	2025/5/20 23:40:54	61秒	B. 女 / Female	B. 大二 / Sophomore
55	2025/5/20 23:41:05	24秒	B. 女 / Female	B. 大二 / Sophomore
56	2025/5/20 23:44:23	26秒	A. 男 / Male	B. 大二 / Sophomore
57	2025/5/20 23:44:50	14秒	B. 女 / Female	B. 大二 / Sophomore
58	2025/5/20 23:45:02	43秒	B. 女 / Female	B. 大二 / Sophomore
59	2025/5/20 23:46:24	39秒	B. 女 / Female	B. 大二 / Sophomore
60	2025/5/20 23:53:25	40秒	A. 男 / Male	B. 大二 / Sophomore
61	2025/5/20 23:53:32	54秒	B. 女 / Female	B. 大二 / Sophomore
62	2025/5/20 23:55:08	32秒	A. 男 / Male	B. 大二 / Sophomore
63	2025/5/20 23:56:11	42秒	A. 男 / Male	B. 大二 / Sophomore
64	2025/5/20 23:56:54	34秒	B. 女 / Female	B. 大二 / Sophomore
65	2025/5/21 0:10:51	42秒	B. 女 / Female	B. 大二 / Sophomore
66	2025/5/21 0:46:20	23秒	A. 男 / Male	B. 大二 / Sophomore
67	2025/5/21 0:46:56	58秒	B. 女 / Female	B. 大二 / Sophomore
68	2025/5/21 0:48:26	64秒	B. 女 / Female	B. 大二 / Sophomore
69	2025/5/21 0:49:42	39秒	A. 男 / Male	B. 大二 / Sophomore
70	2025/5/21 0:51:17	24秒	B. 女 / Female	B. 大二 / Sophomore
71	2025/5/21 0:54:44	58秒	B. 女 / Female	B. 大二 / Sophomore
72	2025/5/21 0:55:35	27秒	B. 女 / Female	B. 大二 / Sophomore
73	2025/5/21 1:06:25	51秒	B. 女 / Female	B. 大二 / Sophomore
74	2025/5/21 1:26:48	26秒	B. 女 / Female	B. 大二 / Sophomore
75	2025/5/21 1:30:25	28秒	B. 女 / Female	B. 大二 / Sophomore
76	2025/5/21 1:55:01	29秒	B. 女 / Female	B. 大二 / Sophomore
77	2025/5/21 4:45:15	43秒	A. 男 / Male	B. 大二 / Sophomore
78	2025/5/21 7:21:32	51秒	B. 女 / Female	B. 大二 / Sophomore
79	2025/5/21 9:10:04	210秒	B. 女 / Female	B. 大二 / Sophomore
80	2025/5/21 9:49:44	29秒	B. 女 / Female	B. 大二 / Sophomore
81	2025/5/21 10:02:43	47秒	B. 女 / Female	B. 大二 / Sophomore

A. 图书馆自习 / Self-study in the library I C. 和小伙伴一起学习 / Study with peers I D. 向老师请教(office hour等) / Consult teachers (e.g., office hours) I E. 实习 / Internship I F. 科研 / Research	15
A. 图书馆自习 / Self-study in the library 1 G. 其他 / Other	3
A 图书馆自习 / Self-study in the library   C. 和小校伴一起学习 / Study with peers	4
A. 图书馆自习 / Self-study in the Norary   B. 参加社团活动 / Participate in club activities   C. 和小伙伴一起学习 / Study with peers   E. 实习 / Internship	8
A. 图书馆自习 / Self-study in the library   C. 和小伙伴一起学习 / Study with peers   F. 科研 / Research	10
A. 图书馆自习 / Self-study in the library   C. 和小校伴一起学习 / Study with peers	5
A. 图书馆自习 / Self-study in the library   D. 府老师课教(office hour等) / Consult teachers (a.g., office hours)   E. 科研 / Research	25
A. 图书馆自习 / Self-study in the library I C. 和小校伴一起学习 / Study with peers	7
A. 图书馆自习 / SetF-study in the library I.G. 其他 / Other	6
A.图书馆自习 / Self-study in the library   8. 参加出团活动 / Participate in club activities   D. 向老明清教(office hour等) / Consult teachers (e.g., office hours)   E. 实习 / Internship   E. 科研 / Research   G. 其性 / Other	30
A. 图书馆自马 / Self-study in the ilorary I C. 和小伙伴一起学习 / Study with peers I E. 科研 / Research	8
A. 图书馆自马 / Self-study in the library I C. 和小伙伴一起学习 / Study with peers I D. 向老师请数(office hour语) / Consult teachers (e.g. office hours)	不修学习吧
B. 参加社团活动 / Participate in club activities [ D. 向老师请教(office hour导) / Consult teachers (e.g., office hours) [ E. 实习 / Internship	5
A. 图书馆自习 / Setf-study in the library I.D. 向老师清教(office hour等) / Consult teachers (e.g., office hours)	8
A. 图书馆自习 / Self-study in the likeary 18. 参加社团活动 / Participate in club activities	10
B. 参加社团活动 / Participate in Ckub activities   C. 和小伙伴一起学习 / Study with peers   D. 向老师清教(office hour将) / Consult teachers (e.g., office hours)   E. 实习 / Internahip   F. 科研 / Research	10
A. 图书馆自习 / Self-study in the library   B. 参加社团活动 / Participate in olub activities   D. 内老师请教(office hour等) / Consult teachers (e.g., office hours)   E. 实习 / Internship	3
A. 图书馆自习 / Self-study in the library   B. 参加社团活动 / Participate in club activities   C. 和小校伴一起学习 / Study with peers   D. 将老师请教(office hour等) / Consult teachers (e.g., office hours)	9
A. 图书馆自习 / Self-study in the library   B. 参加社团活动 / Participate in club activities	10
A. 图书馆自习 / Self-study in the library   B. 参加社团活动 / Participate in club activities   C. 和小伙伴一起学习 / Study with peers	15
A. 图书馆自习 / Self-study in the library   B. 参加社团活动 / Participate in club activities   C. 和小伙伴一起学习 / Study with peers   E. 实习 / Internahip	38
A. 图书馆自匀 / Self-study in the library   B. 参加社团活动 / Participate in club activities	10
A. 图书馆自习 / Self-study in the library [ C. 和小伙伴一起学习 / Study with peers ] E 实习 / Internship	12
B.参加社团活动 / Participate in club activities	2
A. 图书信自习 / Self-strudy in the Ibrary 1 C. 和小伙伴一起学习 / Study with peers	6
C. 和小伙神一起学习 / Soudy with peers 1 E. 实习 / Internship 1 F. 科研 / Petearch	10h
A. 距书值日习 / Self-etudy in the library I D. 均配即调散(office hour语) / Consult teachers (e.g., office hours) I G. 其性 / Other	15
A. 图书馆自习 / Self-study in the library I C. 和小伙伴一起学习 / Study with peers I E 实习 / Internship	14
D. 构地即译数 (office hour等) / Consult teachers (e.g., office hours)	3
A. 图书馆自习 / Self-study in the library   D. 向老师得教(office hour等) / Consult teachers (e.g., office hours)   F. 科研 / Research	10
B. 参加社团活动 / Participate in club activities   G. 其他 / Other	20
G. 其物 / Other	2
A. 图书馆自习 / Self-study in the library   C. 和小伙伴一起学习 / Study with peers   D. 向考虑请教(office hour等) / Consult teachers (e.g., office hours)   E. 实习 / Internship   F. 科研 / Research	30
平信自习 / Self-study in the library   B. 参加社团活动 / Participate in club activities   C. 和小伙伴一起学习 / Study with peers   D. 内老师请教(office hour等) / Consult teachers (e.g., office hours)   E. 英习 / Internship   F. 科研 / Research	15
A 图书馆自为 / Self-study in the library	20
A. 图书馆自习 / Self-study in the Ibrary [ D. 内老师请教 (office hour等) / Consult teachers (a.g., office hours)   E. 英习 / Internship	20
A 图书馆自为 / Saff-study in the library	22
A. 图书信音习 / Self-study in the library   C. 和小伙伴一起学习 / Study with peers   D. 向老师请教(office hour等) / Consult teachers (e.g. office hours)	10
A. 图书馆自习 / Self-study in the library I_C.和小校伴一起学习 / Study with peers I_D. 抱者物講教(office hour等) / Consult teachers (e.g., office hours) I F.科研 / Research	20
*宿告习/Self-study in the Brany [ B. 参加社団活动 / Participate in club activities ] C. 和小伙伴一起学习 / Study with peers ] D. 約名即请数(office hour语) / Consult teachers (e.g., office hours)   E. 实习 / Internatio ] F. 转用 / Peesarch	20
A 图书绘图为 / Self-study in the library I E. 实习 / Internship	25

B. 学习内容对未来就业的帮助 / Relevance to future career [ D. 学习的社交性(与同学互动交流) / Social interaction (peer communication)
B. 学习内容对未来就业的帮助 / Relevance to future career
B. 学习内容对未来就业的帮助 / Belevance to future career [ C. 学习的便利性(如线上随时随地学习) / Convenience (e.g., online learning) [ D. 学习的社交性(与同学互动交流) / Social interaction (peer communication)
B. 学习内容对未来就业的帮助 / Relevance to future career [ C. 学习的便利性(如线上随时随地学习) / Converience (e.g., online learning)
A. 学习内容的趣味性 / Interest of the learning content I B. 学习内容对未来就业的帮助 / Relevance to future career
B. 学习内容对未来就业的帮助 / Relevance to future career [ C. 学习的便利性(如线上随时随地学习) / Converience (e.g., online learning)
A. 学习內容的趣味性 / Interest of the learning content   B. 学习內容对未来就业的帮助 / Relevance to future career   C. 学习的便利性 (如线上随时随她学习) / Convenience (e.g., online learning)
A. 学习内容的趣味性 / Interest of the learning content
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C. 学习的便利性(如线上随时随地学习) / Convenience (e.g., online learning)
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A. 学习内容的趣味性 / Interest of the learning content [ B. 学习内容对未来就业的帮助 / Relevance to future career
A. 学习內容的趣味性 / Interest of the learning content 1 B. 学习內容对未来就业的帮助 / Relevance to future career 1 G. 学习的便利性 (如线上随时随地学习) / Convenience (e.g., online learning)
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D. 学习的社交性(与同学互动交流) / Social interaction (peer communication)
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B. 学习内容对未来就业的帮助 / Relevance to future career [ D. 学习的社交性(与同学互动交流) / Social interaction (peer communication)
A. 学习内容的趣味性 / Interest of the learning content
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B. 学习内容对未来就业的帮助 / Belevance to future career
A 学习内容的趣味性 / Interest of the learning content [ D. 学习的社交性 (与同学互动交流) / Social interaction (peer communication)
A 学习内容的趣味性 / Interest of the learning content I C. 学习的便利性(组线上随时随地学习) / Convenience (e.g., online learning)
B. 学习内容对未来就业的帮助 / Relevance to future career [ C. 学习的便利性(如线上随时随地学习) / Converience (e.g., online learning)
A.学习内容的趣味性 / Interest of the learning content   B. 学习内容对未来就业的帮助 / Relevance to future career   C. 学习的使利性(如线上随时描述学习) / Convenience (e.g., online learning)   D. 学习的社交性(与同学互动交流) / Social interaction (peer communication
A. 学习内容的趣味性 / Interest of the learning content I B. 学习内容对未来就业的帮助 / Relevance to future career

A.学习资源的质量(如课程内容、书籍质量) / Quality of resources (e.g., course materials, books) [B. 个人时间管理能力 / Personal time management [C. 学习环境(如周围环境安静程度) / Learning environment (e.g., quietness) [D. 周边人的影响(如同学的学习积极性) / Peer influence (e.g., classmater' motivation)
A.学习资源的质量(如理程内容、书籍质量)/ Quality of resources (e.g., course materials, books) [ B. 个人對向管理能力 / Personal time management [ C. 学习环境(如国困境安静程度) / Learning environment (e.g., quietness) [ D. 周边人的影响(如同学校学习限性) / Peer Influence (e.g., classmattes' motivation)
C. 学习环境(如周围环境安静程度) / Laarning anvironment (e.g., quietness)
A 学习资源的质量 (如课程内容、书籍质量) / Quality of resources (e.g., course materials, books) [ 8. 个人时间管理能力 / Personal time management [ C. 学习环境 (如同图环境交替程度) / Learning environment (e.g., quideness) [ D. 周边人的影响 (如同学的学习研究性) / Perr Influence (e.g., classmater individion)
A.学习资源的质量(加速程内容、书籍质量)/ Quality of resources (e.g., course materials, books) [ B. 个人對向管理能力 / Personal time management [ C. 学习环境(加風邪液安静程度) / Learning environment (e.g., quietness) [ D. 用边人的影响(如同学科学习限促性) / Peer Influence (e.g., classmattes' motivation)
A. 学习资源的质量(如课程内容、书籍质量)/ Quality of resources (e.g., course materials, books) ] B. 个人时间管理能力 / Personal time management
B. 个人时间管理能力 / Personal time management [ C. 学习环境(如间国环境安排程度) / Learning environment (e.g., quietness)
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B. 个人时间整理能力 / Personal time management   C. 学习环境(如周银环境安静程度) / Learning environment (e.g., quietness)   D. 周边人的影响(如同学的学习积极性) / Peer influence (e.g., classmatter' motivation)   E. 其他 / Other
A 学习资源的质量 (如课程内容、书籍质量) / Quality of resources (e.g., course materials, books) [ 8. 个人时间管理能力 / Personal time management [ C. 学习环境 (如同图环境交替程度) / Learning environment (e.g., quideness) [ D. 周边人的影响 (如同学的学习研究性) / Perr Influence (e.g., classmater individion)
A 学习资源的质量(如课程内容、书籍质量) / Quality of resources (e.g., course materials, books) [ B. 个人时间管理能力 / Personal time management [ C. 学习环境(如周围环境安静程度) / Learning environment (e.g., quietness)
A.学习资源的质量(投源程件容、书籍质量) / Quality of resources (e.g., course materials, books) [ D. 周边人的影响(如同学的平积极性) / Peer influence (e.g., classmates' motivation)
A.学习资源的质量(如课程内容、书籍质量)/ Quality of resources (e.g., course materials, books)
A.学习资源的质量(如理程内容、书籍质量)/Quality of resources (e.g., course materials, books) [C.学习环境(如周围环境安静程度)/Learning environment (e.g., quietness) [D. 周边人的影响(如同学的学习积极性)/Peer Influence (e.g., classmattes' motivation)
A.学习投资的质量(如课程内容、书量质量) / Quality of misources (e.g., course materials, books) I B. 个人时间管理能力 / Personal time management   E. 其他 / Other
A.学习资源的质量(如漢理丹音、书籍质量)/ Quality of resources (a.g., course materials, books)   B. 个人时间管理能力 / Personal time management   C. 学习环境(如周围环境安静程度)/ Learning environment (a.g., quietnes)
A.学习贡源的质量(加速程内容、书籍质量)/Quality of resources (e.g., course materials, books) [ B. 个人對同管理能力 / Personal time management [ C. 学习环境 (加周器环境安静程度) / Learning environment (e.g., quietness) [ D. 周边人约影响 (如同学的学习系吸性) / Peer Influence (e.g., classmates' motivation)
A 学习资源的质量 (如课程内容、书籍质量) / Quality of resources (e.g., course materials, books) [ 8. 个人时间管理能力 / Personal time management ] C. 学习环境 (如周围环境安静程度) / Learning environment (e.g., quietness) [ D. 周边人的影响 (如同学的学习识极性) / Perr Influence (e.g., classmates' motivation)
A 学习资源的质量 (如课程内容、书籍质量) / Quality of resources (e.g., course materials, books) [ B. 个人时间管理能力 / Personal time management [ C. 学习环境 (如周围环境安静程度) / Learning environment (e.g., quietness) [ D. 周边人的影响 (如同学的学习识很性) / Perr influence (e.g., classmates' motivation)
A 学习贯惠的质量 (如课程内容、书籍质量) / Quality of resources (e.g., course materials, books) [ 8. 个人时间管理能力 / Personal time management [ C. 学习环境 (如周围环境安静程度) / Learning environment (e.g., quistenses) [ D. 周边人的影响 (如同学的学习识很性) / Perr influence (e.g., classmates' motivation)
A 学习资源的质量(如果程内容、书籍质量)/ Quality of resources (e.g., course materials, books)   B. 个人时间管理能力 / Personal time management   C. 学习环境(如用面环境安静程度)/ Learning environment (e.g., quietnes)
B. 个人时间管理能力 / Personal time management
A 学习变谱的质量(如源程序管、书籍质量) / Quality of resources (e.g., ocurse materials, books) [ B. 个人时间管理能力 / Personal time management [ C. 学习环境(如周围环境安静程度) / Learning environment (e.g., quietness) [ D. 周边人的影响(如同学校学习积极性) / Peer Influence (e.g., classmates' motivation) [ E. 其他 / Other
A 学习贯惠的质量 (如课程内容、书籍质量) / Quality of resources (e.g., course materials, books) [ 8. 个人时间管理能力 / Personal time management [ C. 学习环境 (如周围环境安静程度) / Learning environment (e.g., quistenses) [ D. 周边人的影响 (如同学的学习识很性) / Perr influence (e.g., classmates' motivation)
B. 个人时间管理能力 / Personal time management [ E. 其他 / Other
B. 个人时间管理规力 / Personal time management 【 C. 学习环境(如周围环境安静程度) / Learning environment (e.g., quietness) 】 D. 用边人的影响(如同学的学习积极性) / Peer Influence (e.g., classmatter institution)
B. 个人时间管理能力 / Personal time management
A 学习资源的质量(如源程内容,书籍质量) / Quality of resources (e.g., course materials, books) [B. 个人时间管理能力 / Personal time management ] C. 学习环境(如用图环境交接程度) / Learning environment (e.g., quietness)
C.学习环境(如周围环境安静程度)/ Learning environment (e.g., quietness)   D. 周边人的影响(如同学的学习标图性) / Peer influence (e.g., classmates' motivation)
B. 个人时间管理能力 / Personal time management [ D. 周边人的影响(如同学的学习界极性) / Peer influence (e.g., classmatter' motivation)
A 学习资源的质量(如果程序语、书籍质量) / Quality of resources (e.g., ocurse materials, books) [ B. 个人时间管理能力 / Personal time management [ C. 学习环境(如周围环境安静理度) / Learning environment (e.g., quietness)
A 学习资源的质量(如果程符会、书籍质量) / Quality of resources (e.g., ocurse materials, books) [8. 个人时尚管理能力 / Personal time management [C. 学习环境(如周军将变种程度) / Learning environment (e.g., quietness) [D. 用边人的影响(如同学的学习研究性) / Per influence (e.g., classmatter intriviation)
A 学习资源的质量(如果程内容、书题质量) / Quality of resources (e.g., course materials, books) [8. 个人时间管理能力 / Personal time management [C. 学习环境(如周围环境安静程度) / Learning environment (e.g., quietness) [D. 用边人的影响(如同学的学习积极性) / Per influence (e.g., classmates' motivation)
A 学习资源的质量(如课程内容、书籍质量)/ Quality of resources (e.g., course materials, books) [ 8. 个人时间管理能力 / Personal time management [ 0. 用边人的影响(如同学的学习限很性) / Peer Influence (e.g., classmates' motivation)
A 学习资源的质量(如课程符音、书籍质量) / Quality of resources (e.g., ocurse materials, books) [8. 个人时尚管理能力 / Personal time management [0. 学习环境(如周围环境安静程度) / Learning environment (e.g., quietness) [D. 用边人的影响(如同学的学习研究性) / Per influence (e.g., classmates motivation)
B. 个人时间管理能力 / Personal time management   C. 学习环境(如国图环境安静程度) / Learning environment (e.g., quietness)   D. 用边人的影响(如同学的学习积极性) / Peer Influence (e.g., classmatter institution)

B. 介人財同管理能力/ Personal time management [ 0. 学习环境 (如同语环境安静程型) / Learning environment (e.g., quiethess) [ 1. 用辺人形影响 (如同学学学习形极性) / Peer Influence (e.g., classmattes' motivation)
 A 学习波影负责 (如連行答: 书籍反重) / Quality of resources (e.g., course materials, books) [ B. 介人財局管理能力 / Personal time management [ C. 学习环境 (如同语环境安静程度) / Learning environment (e.g., quiethess) [ 1. 用辺人形影响 (如同学好学习报程) / Peer Influence (e.g., classmattes' motivation)
 A 学习波影负责 (如連任内容: 书籍质量) / Quality of resources (e.g., course materials, books) [ B. 个人對局管理能力 / Personal time management [ C. 学习环境 (如同语环境安静程度) / Learning environment (e.g., quiethess) [ D. 用辺人形影响 (如同学好学习报程位) / Peer Influence (e.g., classmatter' motivation)
 A 学习波影负责 (如用型环境 不可能力量) / Quality of resources (e.g., course materials, books) [ B. 个人對所管理能力 / Personal time management [ C. 学习环境 (如同语环夜安静程度) / Learning environment (e.g., quiethess) [ D. 用辺人形影响 (如同学好学习报程位) / Peer Influence (e.g., classmatter' motivation)

A. 非扮演意 / Very satisfied
C. 一般 / Neutral
B. 满意 / Satisfied
D. 不满意 / Dissatisfied
B. 满意 / Satisfied
A. 非常满意 / Very satisfied
B. 满意 / Satisfied
B. 满意 / Satisfied
A. 非常满意 / Very satisfied
D. 不满意 / Dissatisfied
A. 非常满意 / Very satisfied
B. 满意 / Satisfied
B. 满意 / Satisfied
B. 满意 / Satisfied
C. 一般 / Neutral
B. 满意 / Satisfied
A. 非常满意 / Very satisfied
A. 非常满意 / Very satisfied
B. 满意 / Satisfied
B. 满意 / Satisfied
B. 满應 / Satisfied
B. 满意 / Satisfied
C. 一般 / Neutral
B. 满意 / Satisfied
C. 一般 / Neutral
A. 非常满意 / Very satisfied
C. 一般 / Neutral
A. 非常满意 / Very satisfied
A. 非常沸度 / Very satisfied
B. 满麽 / Satisfied
B. 满意 / Satisfied
C. 一般 / Neutral
B. 满愈 / Satisfied
B. 满麽 / Satisfied
B. 满愈 / Satisfied
B. 满麽 / Satisfied
B. 满意 / Satisfied

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