Qualitative and qualitative analysis of the impact of informal spaces on the students' productivity

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Abstract

The emerging level of education dictates new conditions for changing learning spaces. The main feature of the modern educational environment is the adapting conditions to the needs of students. The majority of students need specific environments in which they can study and achieve their goals. One of the requests of students is the organization of informal learning spaces. The popularity of informal places in the educational environment is steadily increasing. They are considered to have a positive effect on the student performance. However, the precise methods of the evaluation of the above-mentioned impact are uncertain. Here we show different ways of analyzing and identifying the link between so-called informal learning spaces and students' performance. We have found that many factors, both internal and external, depend on the choice of informal study space. The correlation of these factors helps explain the emergence of a gap between formal and informal places, as well as explain the importance of the organization of informal places in educational institutions. Using the example of a single educational institution: Learning Planet Institute (LPI), our results show which places are in demand with students. What reasons students have for choosing them, as well as what might be a hindrance to productivity. We anticipate that our research can be a starting point for a more sophisticated and wider exploration of the impact of informal spaces on students' performance.

Introduction

Every student has one's own ability to manage time and tasks. Some students consider the place where they work or study as one of the most important aspects of their performance during the day. Nowadays, a rapidly developing environment in which universities operate is the most important factor that allows students to increase their engagement.

In order to continue the discussion, it is essential to give a definition of the 'informal space' concept. There are plenty of definitions in different resources. For instance, according to the Law Insider, 'Informal Open Space: Space used by people for informal unstructured recreation activities such as walking and relaxing, ranging from formal planted areas and meeting places to wilder more natural spaces, including green linkages.' As for this research paper, we consider an 'informal space' a place at the university that does not imply regular classes with a desk and a board. For instance, at the "Learning Planet Institute" (LPI), these places are the Learning Center, basement, lounge zone, and backyard.

For further discussion it is necessary to give a definition of the LPI academic institution. LPI, Learning Planet Institute, is the new iteration of the Center for Research and Interdisciplinarity, or CRI, started by researchers François Taddei and Ariel Lindner in 2006. (Learning Planet Institute, 2022). LPI is a research institute offering diverse programs related to science, research and interdisciplinarity. For our research paper we are considering this institution as an example of a building with informal learning spaces.

There have been many studies on the correlation between students' experiences and informal learning spaces. For instance, in the research *Belonging in Space: Informal Learning Spaces and the Student Experience* (2018) the authors '...demonstrate some of the ways in which institutions can work to inoculate themselves against the range of threats that circulate around

them in this changing environment…' (Morieson L., p. 12, 2018). This study shows the significance of informal learning spaces.

There have been several studies regarding the impact of informal spaces. Many research papers examine the correlation between informal spaces and students' evaluation of their usage. For instance, in the study, *The Evaluation of Informal Learning Spaces in a University* (2020) the authors analyze students' use of informal learning spaces with different levels of design to determine what factors influence the way the students use them. (Lee J.W.Y., 2020, p.225). It is quite important to identify the way the students use the informal learning spaces. However, it is also extremely important to consider the question from the perspective of the students' performance. Therefore, we want to take into consideration the influence of informal learning spaces on students' performance and productivity in our research paper.

There is another aspect that can be considered as a gap in scientific understanding. In another paper Morieson, L. Murray, G. et al, *Belonging in Space: Informal Learning Spaces and the Student Experience* (2018) did research about student engagement and sense of belonging in the University in Melbourne. They did the examination about an existing but underused space in this school called 'atelier'. The authors examine the impact of informal space on students' engagement. However, in their study, they do not consider other academic institutions for comparison purposes. Therefore, we want to make our research study based specifically on the LPI academic institution, which can give us the opportunity to have real results as well as to compare LPI with other universities.

Clearly, there are many complex reasons that cause the emerging gap between informal and formal learning spaces. In light of the above, the literature seems to indicate the ways that students spend their time in informal spaces such as libraries, cafes, and other flexible places in

some universities. Reviewed factors that influence the students' use of these places served as the foundation for the following study. One goal of this study is to analyze and measure the impact that informal learning spaces bring to students' productivity.

However, previous research lacks methods to evaluate the influence of open, informal spaces for example balconies. Eventually, learning can be experienced in an open area or maker-labs in which students can do various learning activities based on student preferences and their activities within.

Building on this hypothesis, this study then seeks to show that informal spaces at the LPI have a positive impact on students' productivity and increase their performance. In order to do that it's significant to analyze the previous research based on the topic "affinity spaces". A survey is conducted to collect data and measure the effectiveness of the impact of informal spaces of LPI on the students' behavior. Processing the raw data to draw a conclusion and to test whether the informal spaces impact positively or negatively on the productivity of the students. Beneficial to make contact with potential survey respondents, the data collection process began by the participation of LPI students from different fields of study as graduate as well as undergraduate students. To have proper and relevant results it expected a diverse sampling group. The next step involved the creation of an online survey that was used to test the hypothesis. Once the survey was completed (using the google forms online survey creation service), an invitation was sent by email to all students at LPI.

Concerning the access to the data we need to have participants' consent to process and analyze it. During the research itself, we will gather the data by questioning a sampling group and then, by analyzing it to see if there was statistically significant support for the hypothesis.

Methodology

The research was designed to obtain the data through Google forms which was circulated to the LPI community. The questionnaire targeted to provide us both quantitative and qualitative data. Quantifiable factors like focus, crowd, comfort and productivity are analysed respective to their place of preference of work.

The questionnaire was divided into 3 sections with 18 mandatory questions and 1 non Mandatory question. Section 1 consists of 9 questions with multiple choices focused on identifying the respondents.

Section 2 consisted of the questions related to open space at LPI and different places of work. The participants were expected to rate the quantitative questions on a scale of 1 to 5 which was consistent throughout the questionnaire.

Section 3 has 2 open ended questions which were included to provide us with descriptive answers from the respondents regarding the open spaces and productivity.
The Google form was sent to the LPI community through email and Whatsapp groups. The total expected sample size was 60 and we received around 43 responses.

The data gathered from the questionnaire are analysed using different data analysis for different quantitative factors. The comparative factors like comfort, crowd and productivity are analysed by correlation analysis along with age, gender and degree. The difference between these factors according to different spaces are analysed using stacked area graphs for easier representation. Boxplot analysis is used for the analysis of responses comparing LPI with their previous schools.

Results

We have conducted a survey among students at LPI to help us gain more insights on whether informal learning spaces affect the learning experience for students. The survey is composed of 20 different questions , 7 of them were quantitative questions , and the 13 rest asking questions about (age group , level of study , birth country , master's track) to evaluate if their attributes account for the obtained results . We have successfully managed to get 42 unique responses which give us a confidence level of 95% +- 15%.
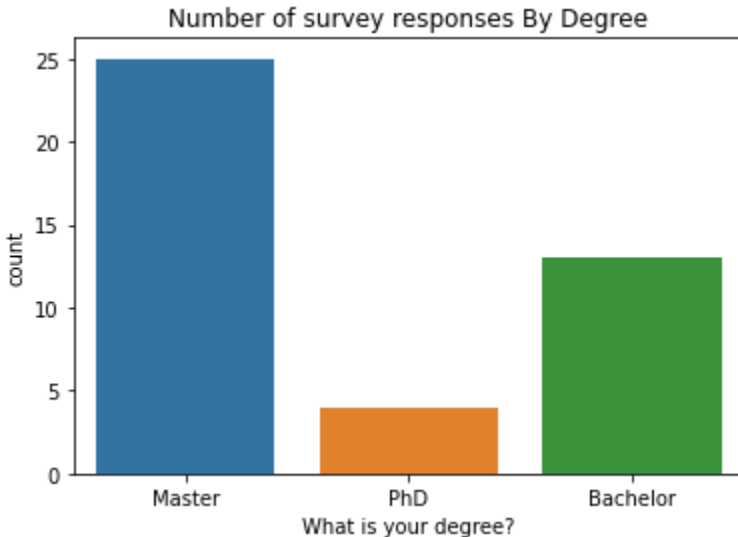

Fig 1 : Number of survey responses By Degree

In figure 1, we can see that most responses came from Master's students and that's due to the fact that school offers a wide range of master degrees unlike bachelor and PhD degrees.
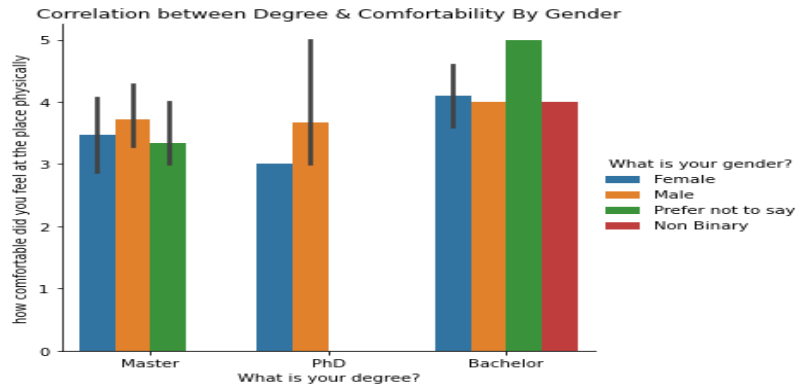
Fig 2: Correlation between Degree & Comfortability By Gender

As we may notice from figure 2 , on average , Bachelor students feel more comfortable at the school than other degree seekers. Most female PhD students seem the least physically comfortable in the school , while Bachelor students seem the most comfortable ones .
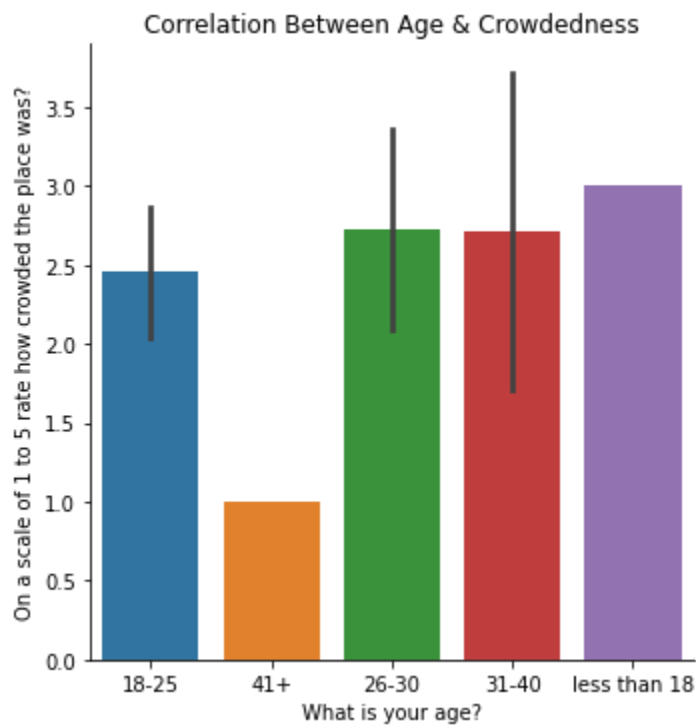

Fig 3 : Correlation Between Age & Crowdedness

In figure 3 , we see the correlation between age group and crowdedness of the place. All age groups except for people over 41 years old feel that the places are moderately crowded since usually people in +41 are PhD students whom they have their own places to work in.
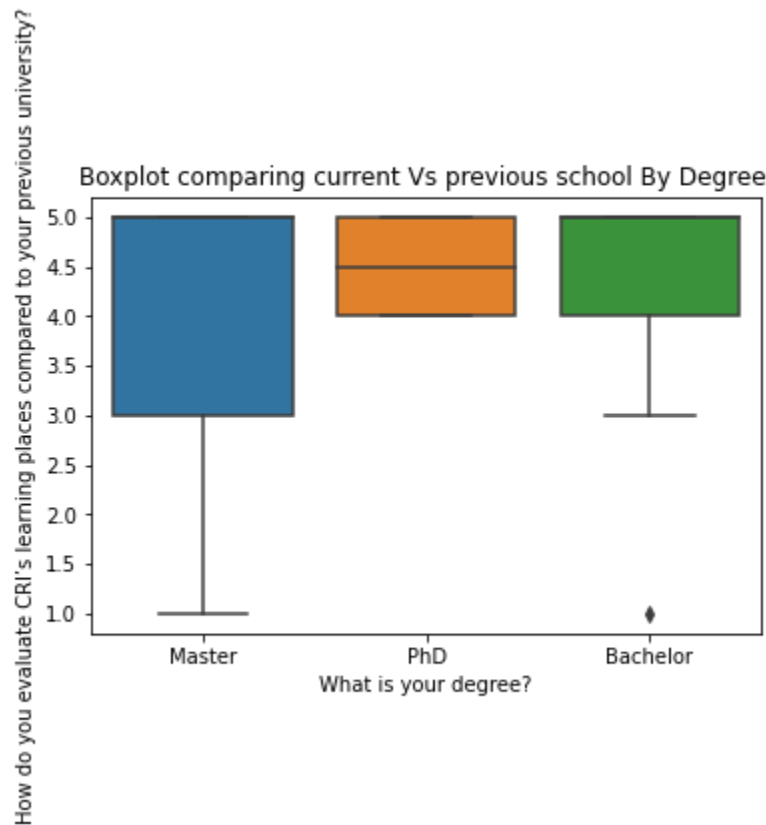

Fig 4 : Boxplot comparing current Vs previous school By Degree

As we notice from figure 4 that master's students have the widest range when asking to compare LPI to their previous school , and we attribute that to the fact that master's tracks attract students from different countries around the world , hence the wide range of answers.we also have one outlier in the bachelor section.Finally , PhD students seem to have a high level of agreement with each other regarding this question.
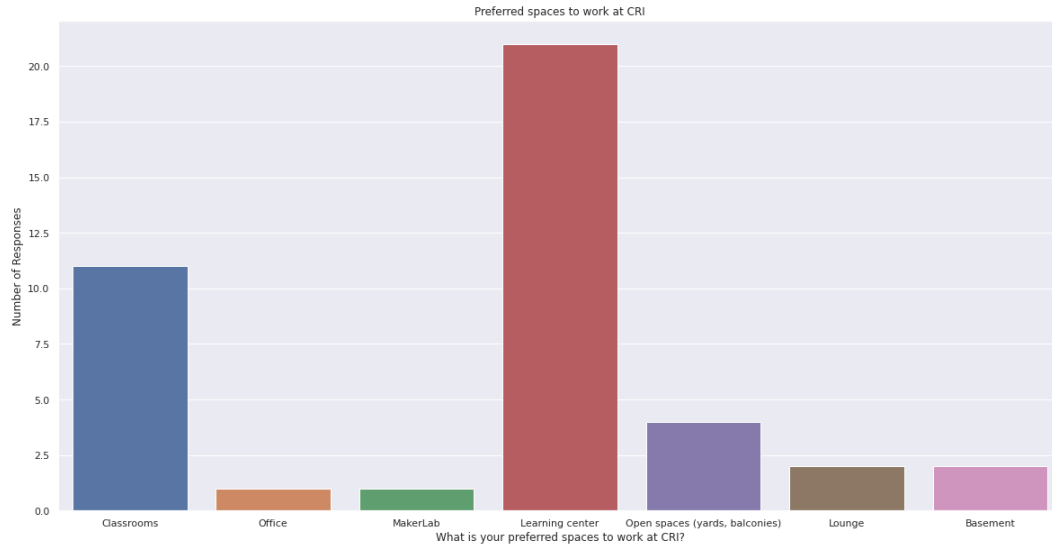
Fig 5 : Countplot of preferred spaces to work at LPI

As we notice from figure 5 , the learning center outperformed all other available spaces at the school by a great margin , that was anticipated given the fact it is well-designed , modern with comfortable chairs and beanbags for students which creates the perfect atmosphere to relax and do some work.

Discussion

To enable a fruitful discussion with an emphasis on our research, it is important to understand how our study can be viewed from the lens of previous literature and the current need, rather necessity for an efficient learning space. Reported student stress and depression are currently at an all-time high, universities could mitigate this crisis with the provision and the inclusion of good informal learning spaces (Oswalt and Riddock. 2007).

From our results, it is evident that a majority of students prefer to work in the learning center, and some of our inferences and reasoning are provided in the following paragraphs. Preference to a learning space depends on the proximity and convenience of amenities such as

food and drinks. As the learning center is extremely close to the kitchen and coffee machine, this choice seems justified, and it is located quite close to any other university space. Even the surrounding conditions such as weather and lighting are extremely important in the selection of space. This is inferred from the reluctance of students to study outside the LPI for extended periods of time. However, this result could fluctuate if the study was conducted in the spring semester when the weather is more tolerable. A good informal space is one of those that enable both group discussion and at the same time, provide enough privacy for an individual (Lee et al. 2020). The design of the learning center, being open enough with the provision of closed seating arrangements enables this, and conversation can be carried out without fear of disturbing external individuals. Since the learning center seems to have been designed with the aim to provide a great informal learning space, it may be of no surprise that it is indeed the most preferred place in the entirety of LPI.

Based on the results observed, there seems to be a trend of master and bachelor students being the most comfortable in these informal learning spaces. This could be due to the fact that the Ph.D. program does not have much in terms of collaboration with other Ph.D. students and removes the peer work aspect. Another reason could be that these students have dedicated workspaces that they are most comfortable with.

There also does not seem to be any link between how focused a student feels in a particular space and how crowded said the place is. Rather, the preference for choosing a location is most likely those that allow collaborative work, comfort. Based on literature by Hunter and Cox. 2014, the reason an informal learning space is preferred is mostly due to the background atmosphere and informality and that the first feeling such a place should inculcate is a feeling of relaxation followed by an urge to be productive. However, distractions and a chaotic

environment can deter a student from choosing the same space another time. Since spaces such as the MakerLab, the lounge, the basement could be considered to be quite chaotic spaces, these options are seen to be picked less frequently by the students. However, there have been some complaints and feedback provided on making the learning center at LPI an even better informal space. For instance, some of the major complaints of the learning center, are that there is a lack of good lumbar support and that lighting is not optimal due to its intense brightness. (data not shown).

These results, however, do not paint the whole picture as LPI supports various diverse informal learning spaces, which many universities do not have and it is rather difficult to compare. To allow fair comparison, this survey must be done in various universities which have ample access to informal learning spaces to understand whether they do promote learning and productivity specifically to LPI. Even cultural differences could be at play and could potentially influence a preference for learning spaces.

Lastly, due to the small population size of LPI and more importantly, the small sample size of 42 individuals, we were unable to get data from a wide age range, as evidenced by only one person filling the survey who is above the age of 40. As the vast majority of students surveyed are mostly pursuing their masters, there are a few challenges in understanding the importance of learning spaces based on level of education, gender, and the homogeneity, such as mostly master's students and not much variability in age, of said population. However, it is extremely important to consider student perceptions when planning learning spaces such that it takes into account the student preferences and dislikes particular to the educational institute that they are a part of (Omolola et al. 2017).

Conclusion

Universities are paying more attention to the atmosphere the learning places create, and more and more, they are going toward designing some informal learning spaces. The question is whether these spaces are optimal in promoting study. This article attempted to study the informal learning spaces at LPI and analyzed the effect of these places on students' productivity. The survey conducted by the authors has indicated a genuine interest in studying/working in these places. Among various informal spaces at LPI, the most preferred places were the Learning Center and classrooms. They mainly described these places with keywords like 'comfortable', 'calm', and 'good lighting'. At the same time, a significant number of students desired changes in these places. Amongst them 'having less noise' and 'better furniture' had the most rates. Even though they are opposites according to our definition, informal learning spaces like the learning center and formal learning spaces like classrooms have been equally preferred. The crowdedness of these two places does not seem to affect the productivity or the preference. Informal spaces like the basement and makerlab were seen as places with more comfort but comfort alone wasn't enough to give these places higher productivity or preferences. This proves that the place of study can be improved with factors like lighting, furniture and comfort rather than it's informality.

Speculation

Our research could not evaluate some aspects since our survey was done in the first semester of 2021-2022 (fall and winter). To name some, we can mention open informal learning spaces at LPI, which could not be used and evaluated at this time of year. Other than that, we could not gather more data from individuals due to time allotment.

Future work will describe the use of these spaces and evaluate them against these principles. It is also good to mention that in future works for having a fair evaluation of informal learning spaces at LPI, it would be better to evaluate LPI among french students or international students who have experienced other universities in France. As most of our respondents were international, our research could not show a fair evaluation.

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