A study on the interaction between students and their ecological environment and its effect on their learning

Reap Benefit
Study done with Psychology students of IX'E'

REAP BENEFIT
MAKING GREEN A HABIT
www.reapbenefit.org
For and with SKCH CBSE
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1. Foreword

To be added
2. Introduction

Based on the interactions SKCH has had with Reap Benefit through Reap Benefit’s environmental student engagement programs at the schools, a research was commissioned to understand the interaction between the students and their ecological environment and possibly a correlation between ecological environment and the engagement levels of the students.

This started as an observational study to understand how students interact with their physical ecological environment and to understand if it has an impact on the engagement level of the students in the classroom. While the study started as a general observational project, it evolved into a project that required us to elaborate on the theoretical framework to better understand and interpret the results and possibly suggest the best interventional outcomes or suggest areas for further research.
3. Executive Summary

An observational study to understand how students interact with their physical ecological environment and to understand if it has an impact on the engagement level of the students in the classroom.

The main focus of the study has been on the interaction of students aged between 12 - 18 and their ecological environment in the context of their engagement in the classrooms. The first leg of the study concerns understanding how the students perceive their environment and how they respond to their learning environment. The second leg of the study involves installing interventions in the observational environment and recording any perceivable changes in the engagement levels of the students. These two legs of the study are briefly reviewed in this report.

As we started the research it became clear that in order to understand and interpret the data collected it important to have an understanding of the theoretical framework for the study.

The learning environment, primarily the school in this study is seen as an ecological environment in which the students constantly engage with it. The engagement of the students with their ecological environment is seen from sensory learning perspective to understand the influence of personal world view of the students in these engagements.

Based on the understanding of the engagements, specific ecological interventions will be introduced in the environment and the changes in the engagement levels documented. These changes will be studied for possible bring backs to the larger school environment to improve the engagement levels of the students.

What are the environmental elements most common in the student’s favourite locations?

16 of 72 factors contribute to about 50% of the responses. And 6 of these factors contribute to 33% of the responses.

Figure: The top 6 commonly chosen factors in %.
Which of these elements do they prefer the most?

![Bar chart showing the top 6 most preferred factors in 1st place.]

- Breeze: 10%
- Greenery: 8%
- Plants: 8%
- Spacious: 5%
- People: 5%

**Figure: The top 6 most preferred factors in 1st place.**

What kind of emotional and intellectual responses do these elements create?

The top six emotional responses account for 74% of the responses.

![Bar chart showing the top 6 most mentioned emotional responses.]

- Happy: 21%
- Creative: 21%
- Sensetive: 11%
- Laidback: 9%
- Serene/Peaceful: 6%
- Connected (to nature): 5%

**Figure: The top 6 most mentioned emotional responses.**
Which of these elements and responses would they like in their classrooms?

The students expressed interest in having breeze in the classrooms and a view of the outside world and greenery.

![Bar chart showing the top 8 most mentioned elements that the students would like in their classroom.](chart.png)

Figure: The top 8 most mentioned elements that the students would like in their classroom.

Do these elements have an effect on their need/want to read/write or be creative?

<table>
<thead>
<tr>
<th>Factor</th>
<th>Read</th>
<th>Write</th>
<th>Be Creative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breeze</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Greenery</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Spacious</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Plants</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brightness</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

How many of these elements can be actually replicated in the classroom?

At the end of the research we will be able to determine which of these above elements can be replicated in the classroom.
4. Theoretical Framework

**Figure: Environmental contexts during the formation of the personal world views.**

**Personal World View**

The interaction at home and school and the learning environment they provide form the basis for the child’s concept of himself or herself, other people and the world. Home is the first place in which the he/she is in a social group and gets feedback about his or her actions in interaction with family, making it the first learning environment for the child. The school environment is where the child spends a major part of his/her impressionable years and has a large number of social interactions with and receives feedback about the same, playing a crucial role in the formation of his/her world view. Considering that the home environment is where the child interacts and receives feedback about the same. This forms the earliest social environment in which the personal world view of the child is constructed. This is further modified and developed in the school environment, and this leads to him or her channelling selective attention and, through that, perception and learning. This leads to the child perceiving and interpreting the world and his environment and its elements according to this world view. The development of the world view is an on-going learning process, but majority of it is formed through childhood and adolescence.

**Personal World View in this Study**

Personal world view is constructed in the interaction process between a person and the environment. Children may therefore be seen to construct their personal world view in their learning environments such as schools. How can this process, and its phase, affect children’s view on their ecological environment? For example, children who are brought up and have had their early education in a quiet and clean environment might face certain difficulties concentrating in schools that are located in noisy and polluted environments because the environment is conducive for learning in their personal world view. On the other hand, children who are brought up and have had their early education in a quiet and clean environment might thrive in schools that provide a similar environment.
**Learning Environment**

Learning environment refers to the diverse physical locations, contexts, and cultures in which students learn. Since students may learn in a wide variety of settings, such as outside-of-school locations and outdoor environments, the term is often used as a more accurate or preferred alternative to classroom, which has more limited and traditional connotations—a room with rows of desks and a chalkboard, for example.

The term also encompasses the culture of a school or class—its presiding ethos and characteristics, including how individuals interact with and treat one another—as well as the ways in which the physical school environment enables learning—e.g., by conducting classes in relevant natural ecosystems. And because the qualities and characteristics of a learning environment are determined by a wide variety of factors, school infrastructure, teaching environment and other features may also be considered elements of a “learning environment.”

**Learning Environment for this study**

For our study we define the learning environment as everything physical, psychological and structural within the school premises as the learning environment.

**Perceptual Learning**

Perceptual learning then refers to an increase in the ability to extract information from the environment, as a result of experience and practice with stimulation coming from it. That the change should be in the direction of getting better information is a reasonable expectation, since man has evolved in the world and constantly interacts with it. Adaptive modification of perception should result in better correlation with events and objects that are sources of stimulation as well as an increase in the capacity to utilize potential stimulation.

**Perceptual Learning in this study**

In this study we define perceptual learning as the ability to extract information from the environment and his ability to modify perception in the context of the world view discussed above.
5. Empirical Study

Leg 1 of the study:

Learning environment: the school

This study focuses primarily on the school as a learning environment however data points were collected, albeit in smaller numbers, about the home learning environment to understand the difference the influences of their home learning environment in their school learning environment.

Considering that the school is located in a largely secluded area with a large green cover on and off campus, majority of the respondents could strongly relate with ecological components of their school campus. This influence is not only visible while the students are outdoors but also while they are in the classrooms.
The respondents have developed associations with various parts of the campus with various parts of their life on the campus. They often sit at the same place for their lunch, and sit at a particular location when they want to have a chat with their best friend. Over the course of the research through multiple tasks, activities, interviews we have been able to narrow down the favourite spots of the students to the nine mentioned in the above figure. We believe that the understanding of these spots gives an insight into how the students perceive their outdoor ecological environment.

Majority of the spots chose have a view of the lush greenery outside the campus. The lush greenery is often contrasted with the buildings that become a part of the view. On campus, most of the spots chosen are under or next to a tree. Grass cover is a common feature in most of the locations. Sounds of birds chirping and breeze characterise these locations.

**Ecological Environment – Indoors**

The respondents mostly relate to natural light and breeze as ecological environment within their classrooms. However when probed into how ecological elements can add to the learning experience of the classroom, majority of them responded that they would like plants, specifically flowering plants and creepers in the classroom. Some other factors suggested by the respondents include having a fish tank in the classroom and adding wind chimes.

**Sensory appeals**

In order to ascertain how the above mentioned perceptions and preferences were formed and to understand the students world view. We conducted a series of activities including a VAK survey.

**Figure: Spots that are most often used or referred to in the various surveys, interviews, and activities during the course of the research**

**Ecological Environment – Outdoors**

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**Figure: Sensory learning styles survey results** (Modality with the highest score (maximum being 18) is the preferred modality, modalities with score of 10 or higher are the modalities frequently used and those with a score of less than 10 are modalities that are not often used)
As a part of the study, VAK (Visual, Auditory and Kinaesthetic) learning survey was done with randomly chosen sample group of students from SKCH CBSE, aged 12 – 17. While the results showed that all the sensory modalities are frequently used, strong preference is given to visual learning which was also reflective in their definition of ‘environment’ and the visual appeal that their learning environments has on them. Kinaesthetic modalities seem to have a greater appeal over auditory appeal which is skewed when compared the general population where the auditory modalities have a greater appeal over kinaesthetic modalities. This could be reflective the holistic learning methodologies adopted by the school.

Visual appeals:

Considering that visual learning has the highest VAK score, it is no surprise that environmental perception and preference of majority of the respondents heavily relied on their visual modality. An interesting observation in the study is that the expectations of respondents from their environment were very similar both indoors and outdoors. For instance, they preferred sunny days over gloomy days, similarly they overwhelmingly preferred naturally lit rooms over dark rooms and artificially lit rooms. Another instance of such a similarity would be their desire to have greenery within their classrooms similar to their outdoor environment. One of the responses from a student when asked to describe their ideal classroom was “A classroom that allows natural sunlight, has many potted plants in the room, has moss on the ground, flowers on the plants, and wind rustles the leaves of the plant”. Similarly students preferred open spaces both indoors and outdoors over closed and small spaces.

In the outdoor environment students prefer places that have a scenic view and/or overlook a green patch and has minimal number of people around. Students prefer locations that overlooks grass, plants particularly the flowering kind, and trees. Of the places chosen by the respondents, insects are a noticeable part of these environments as in the case of respondent Rituparna described her chosen location in the school as “sitting under the Aktonia Scholaris tree, where the grass is green, the field in front is big, and there are many dragon flies around”.

Auditory appeals:

As indicative in the VAK survey, respondents did not give as much emphasis to auditory information as they did to other sensory perceptions. However, some of the respondents, only when further probed responded that they like the sound of birds chirping. An equal number of respondents also mentioned that the lack of any sound appeals to them. A noticeable feature of the school is that, from most parts of the school, one can hear birds chirping. A less often cited auditory appeal is that of the wind and water.

Auditory appeals have significant contrasts when its appeal indoors is compared with that of it outdoors. Respondents cited that they prefer to concentrate on their teachers while teaching and not be distracted by any music or sound. A small number of respondents proposed the idea of having wind chimes in the class rooms. In an odd case, one of the respondents said “I would like Debussy or Beethoven play in the background of the class with nearly-but not entirely-inaudible volume.”
**Kinaesthetic appeals:**
Majority of the responses with respect to kinaesthetic appeal had similar responses much like in the case of visual appeal. While kinaesthetic appeals outdoors and kinaesthetic appeals indoors were similar, the respondents expected different emotional and intellectual responses in these two settings. In the outdoor setting they expect the perceived information to give them a sense of peace. Whereas in the classroom, expectation is that it will help improve their engagement levels.

In the outdoors settings, majority of the respondents expressed that they like to sit on grass because they like its softness and open spaces because they can feel the breeze on their skin, and the warmth of the sunlight on them. The following response captures the essence of what majority of the responses were. “The grass makes the place pricky yet soft. Breeze, cool and slow brushes past the skin gently. While the sun shines over me”

In the indoor settings, an overwhelming majority of the respondents said that they would like feel the breeze in the classroom and keep the windows open.

When given an option between a classroom that is small, poorly lit but has chairs and a classroom that is big, well lit and has chairs. Approximately half of the respondents chose the first room because it offered chairs while the remaining half chose the second room because it was big, open, well lit and felt more informal.

**Other sensory appeals:**
Gustatory appeal is the least cited sensory appeal as the extent to which their interaction with their environment particularly for taste is very limited. Olfactory appeal is mostly limited to that of the smell of flowers, moist soil, and wind. In the outdoor environment the word ‘fresh’ is often used to describe the smell of the above mentioned elements of the environment.

**Responses**
Based on the information perceived and processed through their conscious and sub-conscious sensory modalities, it often elicit either an emotion and/or intellectual response. With the current group of respondents, emotional responses were more noticeable and captured in the various interviews, questionnaires and activities. In the case of intellectual responses the group has struggled to articulate their responses.

**Emotional responses:**
An overwhelming majority of the respondents associate their ideal outdoor environment with providing ‘calm and peace’. This can be attributed to the fact that majority of the respondents who expect calm and peace are also the respondents who want chose large open spaces with few people. Main activity of the respondents at this place is often quiet conversations or ‘getting lost in thoughts’.

**Intellectual responses:**
As mentioned earlier, in the case intellectual responses, we could not get the respondents to articulate their answers. Only a small number of respondents said that a given environmental setting has an intellectual response on them. The answers ranged from “Thoughts flow freely” to “I feel creative”. We have however not been able to establish a pattern in this case.
Leg 2 of the study:
This leg of the study involves introducing pre-planned interventions such as introducing plants the classroom and documenting the change in the engagement levels of the students of the class. This leg of the study is still underway.
6. Conclusion and Recommendations

To be added the completion of the study.
7. References
To be added
8. Annexure

The data collection methodology:

**Cards:**

Subjects are taken to their favourite spots in the school and made to pick up cards from the following set to describe the place:
Then arrange the cards based on the questions asked: