Abstract

Learning space configuration in primary education (PE) usually presents several factors which often cause distraction, differing to stimulation. Design space is complex, due to the various variables which should be addressed. There is a study conducted in elementary schools in Chile showing that one of the main distractions is the large amount of information included in classrooms. It varies from general information, support documents to learning and decorative elements not consistent with training. This study aims to know about incidence of changing paradigm in conception of elements considered in classrooms, based on changes in appearance and content in vertical walls.

The hypothesis suggests that design and control in study spaces can influence students’ performance; an improve relationship between spaces designed for learning should be proportionally related to emotions produced. If a space is prepared for any action, so users to be comfortable, result could only be positive effects.

Methodology addresses the design of vertical walls in educational spaces of primary schools, using affective engineering methods for systematic collection of emotional concepts that encourage students’ learning. Once this information is processed, alternatives are designed to generate emotional links favorable to learning.

Results are associated with the increase of psychological comfort indexes for concentration. Textures and mono-color acquire important role, unveiling forms, tones and fragments favorable in children learning, delivering environment in complement with didactic teaching material. It can be concluded that the appreciation of these spaces generates positive synergies between students and their relationship with learning since distractions and unnecessary elements have been replaced by textures that offer a pleasant perimeter to the eye. On the other hand, textures conform environments associated to emotions that children expressed they would like to feel in classroom. Finally, differentiation factor is found in learning environment, which satisfies emotional needs and improves perceptual qualities of students, granting intentionality from the affective to receptive.

Keywords: Affective engineering, emotion, educational spaces, textures, learning-teaching.

1 INTRODUCTION

The classroom in the case of primary education is complex since it has always been established that it should be the place of stimulation mainly, but in certain cases, it is at the expense of producing an attitude of concentration.

In children of primary education, one of the mechanisms that leads to unfolding the motivation and interaction of them with their environment, is the integration of multisensory stimulation [1], that is, to awaken their senses, to enter into relationship with what it surrounds them [2], through all the elements that make up the set of environments of routine human life; as are the areas where daily activities are carried out: home, school, recreation, etc., in a way that influences individuals in a positive way in the development of their activities [3].

By nature, the normal situation of the human being is polysensory, not a single sense is favoured, external stimulation is inevitably exercised over more than one direction [4], and the importance of this ability to experience the multisensory perception, lies in which has shown that a multisensory stimulus [5] produces effects superior to the sum of the stimulation effects of each sense separately [4].

The tasks and educational activities in children of primary level are directly focused on stimulating sensory education, that is, they use the senses as the access routes to their first knowledge and to the understanding of the closest physical and social environment and of themselves. [6], also contributing to children knowing the properties and qualities of things [7] "There is nothing in my intellect, which has
not gone through my senses," said Aristotle. It is, therefore, that through the sensory-motor system that
the world in which they live is experienced [8] and that is why we can affirm that though creativity and
learning arise from experience. It is, therefore, essential to create environments where sensory
experience is abundant and free, where learning patterns are formed, thought is activated, and creativity
is stimulated [9]. Albert Einstein said that "learning is experience; everything else is just information."

Why children do not receive ideas or concepts to apprehend; but images? Children retain sounds,
figures, sensations and rarely ideas; all their knowledge is in the sensation.

A sensation is an information, which precedes perception [10]; an image is the memory of a sensation.
The sensations are where the information accesses the brain, link children (and man in general) with the
outside and are the essential source of their knowledge, the beginning of all experience [11].

The sensation is a fast process that fulfils an adaptive function, a response to a stimulus, and before a
same stimulus, you can have different perceptions of the sensation, which varies to a particular emotion,
in a particular person, or in a given situation [12]. It is this sensation that translates into an emotion, that
is, an intense and transient mood alteration, pleasant or painful, that leads to a feeling, that is, an
affective state of mind. The emotion lasts little, but the feeling it generates often lasts. The Portuguese
neuroscientist Antonio Damasio [13], states that the feeling is the consciousness of emotion, arguing
further that emotions are linked to the body, while feelings are related to the mind, an emotion is
transformed into feeling to the extent that one becomes aware of it, that is, the feeling is the emotion
plus the ideas that accompany it [13].

Currently, emotions are investigated with a new vision about their nature, as a "foundational link of our
experiences with reality and even as a key element of our identity as human beings" [14, p.20]. They
are largely stereotyped, but they are modulated by learning, by the experiences of each one [13]; so
they depend on the subject that experiences it and are felt with a singular and specific quality [15].

In children emotions are spontaneous, they appear before any stimulus, being recorded as feelings that
nourish their experience towards learning. In them (emotions) "the innate, the lived, and the learned are
conjugated" [16, p. 66]. Children are able to feel, express and recognize positive or negative emotions
from an early age, constantly learning from the environment in which they live and develop. Each type
of environment helps the child discover the different aspects of life that he assimilates unconsciously. It
is important that the different environments interact and that they are constructive [17] for them.

The school classroom in primary education is the second environment in which children remain for a
great part of the time; the family atmosphere of the home is the first. It is in this space of the classroom
where children carry out their learning process and so that all the assimilation capacity of a child can
develop, requires an adequate environment that serves as motivation [18], with significant experiences,
multisensory stimuli and adequate physical resources [19]. Many times it is thought that the more
information is intended to cover the walls of the primary classroom, the greater the stimulus caused. But
already several investigations are showing that children in highly decorated classrooms are more
distracted, spend more time without paying attention to the task and demonstrate small advances in
learning, than when the decorations are removed [20], the visual environment is very saturated with A
classroom can affect attention and concentration, which could lead to feelings of frustration in children.

A study has shown that the accuracy in the responses of children has been greater in the classroom
with poor decoration, than in the decorated classroom [20], learn more when the space is light visually.

On the other hand, if you want to provoke positive emotions in children, that stimulate them to an
appropriate learning, you should consider, the design and the control of the information exposed in the
walls of the classrooms, a content and a space that is capable of to move and to generate sensations
[21], inhabiting it from the connection, an interaction of the student with the space, from the multisensory,
in search of the sensoriality [22]. It is not just a change in appearance, but also comfort, psychological
balance, well-being, concentration, through "sensory perceptions, such as light, shade, transparency,
chromatic phenomena, texture, material, and the details, all this participates in the experience of space"
[23, p.9].

If a space is designed for the exercise of its purpose, for users to feel comfortable, the result can only
be a positive effect.
2 METHODOLOGY

The method used in the proposal validates the way in which the content variation of the support elements currently considered in classroom walls can influence, after producing a change of appearance and content in these vertical structures that make up the space Learning. This change in the presentation of the walls can contribute favorably in the psychological comfort of the students and on the other hand the control, and the order in the amount of the content exposed in the classroom should be proportionally related to the emotions produced in the students. It is about creating a change in the walls that surround the environment, controlling the exposed information, combining with visual textures to generate a positive effect and concentration.

To carry out the experience of this change, techniques of affective engineering have been integrated to investigate the acceptance projections linked to the mental well-being within the classroom. It has been divided into three stages designed to know the perceptions of children in three different spatial situations, for which they have been consulted in a very didactic way, for the comfort and comfort they feel during the time they remain in it.

The exercise was carried out in two different classrooms, to test the experience with children of different ages, the first was carried out with 23 boys and girls from 6 to 7 years old and the second with 19 boys and girls between 9 and 10 years old, verifying an experience for each day.

Three spaces were presented to the children to experience them during their normal day of classes, in periods of two hours each and with intermediate 30 minutes of recreation between the presentations of each space. About 20 minutes before the end of the corresponding time, all students are given a set of five cards with images that represent emotional concepts, with which they will make known their preferences, regarding their experience in the space.

The spaces designed for the experience were three, and they were presented sequentially, with intervals of rest between each one.

- **Space 1:** Environment saturated with information, walls, and windows with various didactic images, drawings, maps, letters, numbers, photos, hours, weather, signs, all types of visual communication, assuming pedagogical support.

- **Space 2:** Environment to which it has been removed, of walls and windows, all the didactic information, the walls have been left completely empty and of the original color, light yellow.

- **Space 3:** Environment in which six panels with white monochrome textures have been arranged, from sky to ground, on the side walls, three on each side, leaving wall areas in which a few support images have been arranged alternating with spaces empty.

3 RESULTS

3.1 Classroom 1, day 1

In the classroom with younger children, there is a certain tendency for the walls to contain some information but not in an exaggerated form, the absolute vacuum does not please the majority, and the textures grant a kind of pause in the context that invites them to touch and feel the reliefs with curiosity. In the saturated space it has also been perceived that children become more restless, it is more difficult to keep them calm in a certain activity.
Table 1. Results survey of 23 children between 6-7 years

<table>
<thead>
<tr>
<th>Emotions</th>
<th><img src="image" alt="Smiley" /></th>
<th><img src="image" alt="Smiley" /></th>
<th><img src="image" alt="Neutral" /></th>
<th><img src="image" alt="Sad" /></th>
<th><img src="image" alt="Cry" /></th>
</tr>
</thead>
<tbody>
<tr>
<td>Habitat 1</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Habitat 2</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>Habitat 3</td>
<td>12</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

3.2 Classroom 2, day 2

The activity with the older children was similar to the previous experience, with the difference that most of them do not like the saturation of elements in the walls, they are distracted and tired with so much information, it is too much visual stimulation that does not favor to concentration. The textures seem interesting to them, and they prefer them over the absolute vacuum since they grant games of light and shadow that change with the intensities of daylight.

Table 2. Results survey of 19 children between 9-10 years

<table>
<thead>
<tr>
<th>Emotions</th>
<th><img src="image" alt="Smiley" /></th>
<th><img src="image" alt="Smiley" /></th>
<th><img src="image" alt="Neutral" /></th>
<th><img src="image" alt="Sad" /></th>
<th><img src="image" alt="Cry" /></th>
</tr>
</thead>
<tbody>
<tr>
<td>Habitat 1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>6</td>
<td>11</td>
</tr>
<tr>
<td>Habitat 2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Habitat 3</td>
<td>12</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

4 CONCLUSIONS

The sensory design is one that can generate experiences based on perceptual enrichment, capable of fully integrating the human being and his senses in the spatial environment, allowing the activities developed in that space, to be fulfilled in full and with all the psychological comfort and emotionally satisfied, because it is demonstrated that the environment has a behavioural, psychological and emotional influence on the people that inhabit it.

The generalized tendency, in the classrooms of children all over the world, is to fill the space with everything that is available, this behaviour validates the expression horror vacui of antiquity, fear of emptiness, with the belief that while the more visual information the child has, the more stimulated he will be and therefore he will learn more.

Current research is already demonstrating the opposite, and in this experience with children, it has also been verified and confirmed that the least is more, that is, not the absolute empty, but the space covered with other elements, as in this case the textures.

It has been demonstrated in this exercise, that the innovation with the textures, come to increase, on the one hand, the concentration and therefore better performance, and on the other hand, the imaginative, creative and conscious capacity, achieving a better balance between the attention and the results, between the emotion and the mental, between the stimulating and the inspiring.

The premises of the design of experience and emotional design applied in the field of design projects to product may also be viable in other areas, their application being extended to spaces so that they become experiential.

Taking into account the role of the senses in the perception of space, it is necessary to discover how the sensations manifest themselves, to know the interaction between the stimulus and the impression; supported by, the memory and imagination, in order to materialize in the space those criteria that as a whole are capable of exciting and at the same time granting pleasure to those who inhabit it.
ACKNOWLEDGEMENTS

The authors thanks the National Scientific and Technological Commission of Chile, through FONDEF project ID17-10366 and CONICYT project N° REDI170581.

REFERENCES


