

Indoor air quality in school buildings. Study case on two primary schools in Turin
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Indoor air quality defines a condition in which there are no harmful rates of pollutants in a delimited environment (houses, schools, hospitals, etc.), according to prescriptions of competent authorities and when a meaningful quantity of people (80% or more) doesn't show any dissatisfaction towards it (Standard ASHRAE 62 – 99).

According to such definitions, a study on the problem of Indoor Air Quality in school buildings was carried out. School is an environment where the indoor air quality assumes crucial importance for the health of its occupants; it is understood that children are weaker subjects and potentially more at risk in a polluted environment.

Studies dealing with the subject show that a uncomfortable or unhealthy indoor environment interferes with teaching activities and can cause discomfort, irritations to breathing ways and several health problems on short or long terms on pupils, teachers and on the rest of school staff. Indoor pollutants can be particularly harmful for pupils affected by allergies and asthma

The aim of the study was to support the theory by conducting polls on site. On one side, it was made an evaluation on how different building types, different building materials, heating, ventilation and air conditioning systems (HVAC), schoolroom furniture and people themselves may influence the environment comfort in the considered school buildings; on the other side the “objective” conditions of the indoor environment, surveyed through automatic instrumental systems (chemical, physical, microbiological and microclimatic analysis), were compared to the “subjective” judgment on comfort or discomfort felt inside the school itself, showed by the considered sample of the people, who filled in some tests.

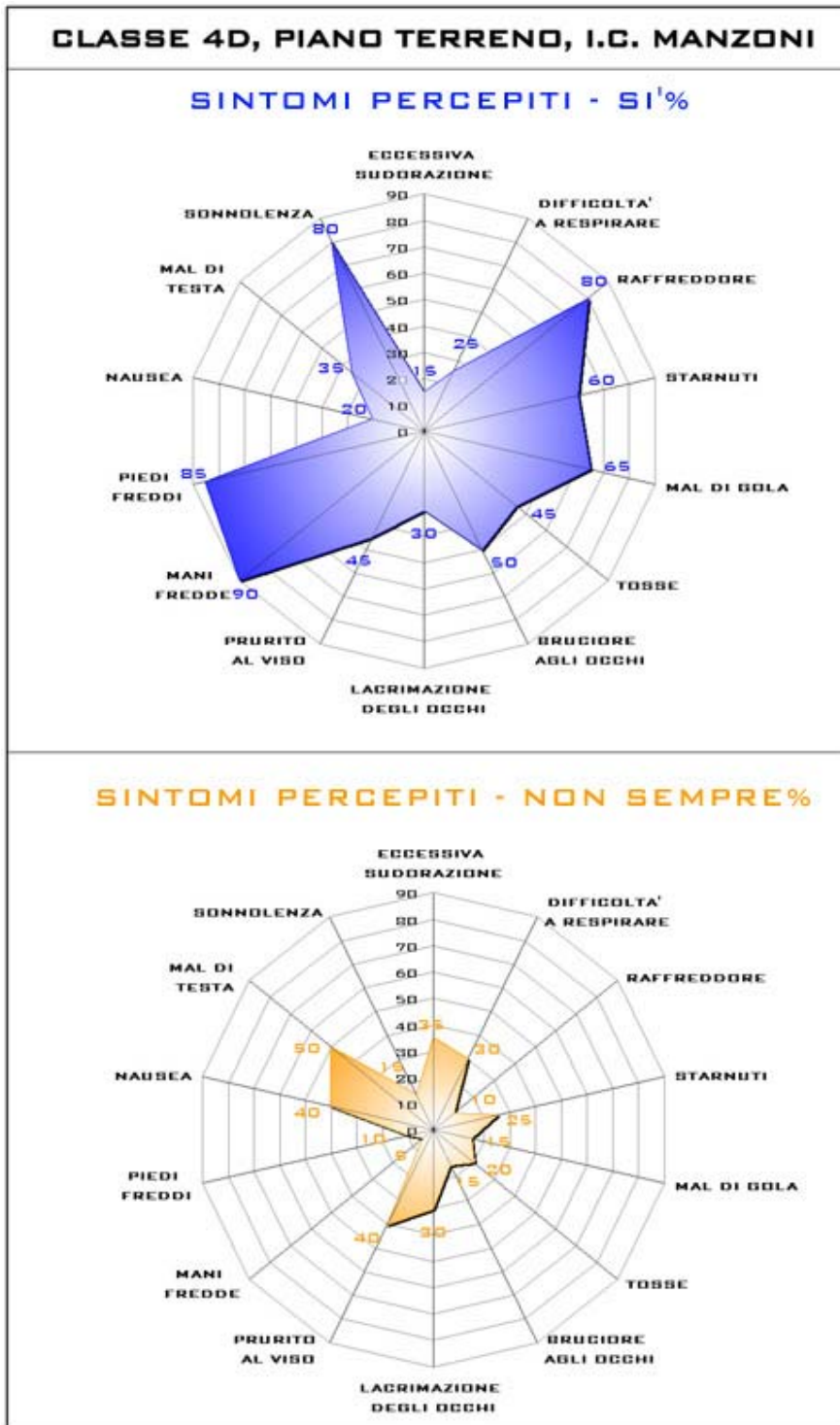


In the tests, which were prepared on purpose for the experimental research, there were also some open questions. The answers to such questions allowed to gather two interesting information:

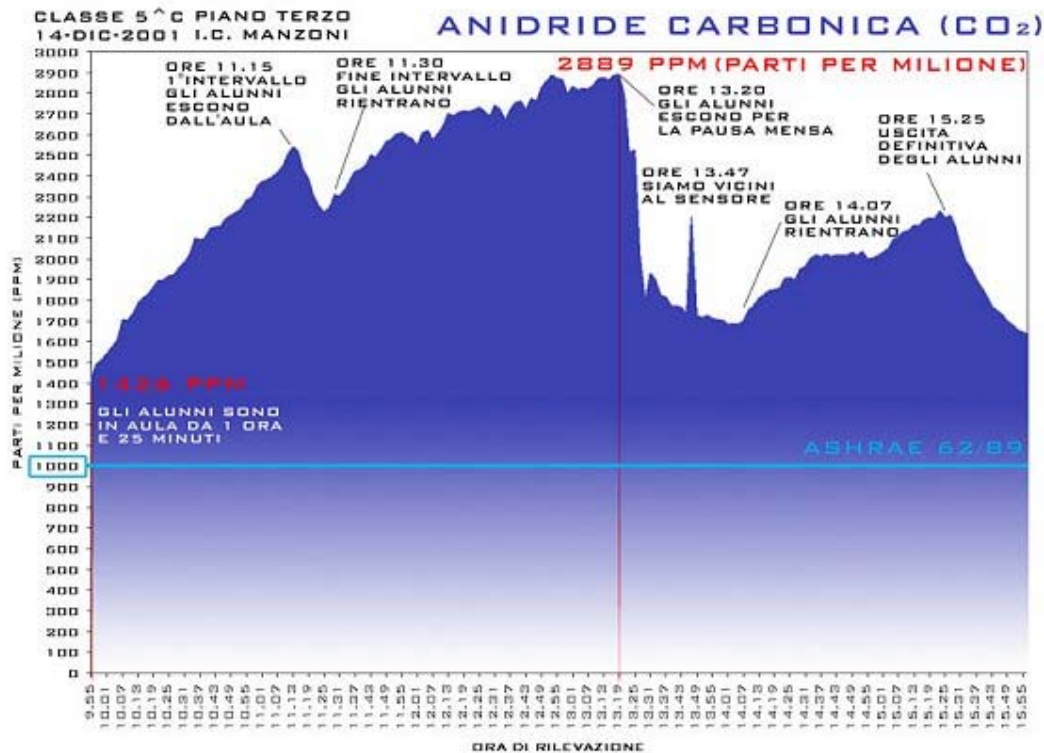
1. About 50 % of the sampled people, school staff, teachers, pupils, declared that when leaving the building the most common symptoms decrease (headache, throat dryness, nausea, etc.), 25% declared that they disappear totally. This means that two third of the sampled people recognizes a link between indoor environment and appearance of frequent and tedious symptoms.

2. The season causing more discomfort problems in delimited environment is winter.

The data gathered from the questions with “closed” answers required some radar graphics, divided into environmental perceptions and appearing symptoms, because of the great number of the sampled people.



Such graphics were taken into consideration in order to dispose of practical instruments, visually clearer and easily comparable to graphics related to the patterns over the 7 sampled hours on microclimatic parameters, PMV (Predicted Mean Vote) and PPD (Predicted Percentage Dissatisfaction) indexes, carbonic anhydride and flow of ventilation air



Finally, after having gathered information on IAQ in the Italian and European schools and the related effects on a bad indoor air quality, after carrying out experimental polls in two schools in Turin, the study was concluded by writing guidelines, which can give designers useful indications when defining a healthy school environment.

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