ISSN: 2538-3019, EISSN: 2676-4806
DOI: 10.30479/AT.2020.12074.1381
Journal of Architectural Thought, Volume 4, Issue 7, Spring and Summer 2020

Assessment Optical Patterns Affecting the Quality of Life of Residents of Residential Units Using Fractal Geometry

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Submitted: 2019-12-01

Accepted: 2020-02-19

Abstract

In the present era, the issue of Quality of Life (QOL) and its promotion among dwellers of residential units and also evaluation of its affecting factors has become a challenging problem. In fact, it requires a meticulous scrutiny of theoretical frameworks in the field of architecture, sociology, and psychology. In the present investigation the element of light and the role of skylights and light patterns, as natural tools, are focused to evaluate the QOL among residents of apartments. According to the conducted investigations and the relation between residents' perception and light, fractal geometry has been utilized to receive light in internal space of apartment as the fractal geometry, based on human's visual perception, has homogeneity with nature in terms of shapes and lines and it is easy to process its aesthetics via the cognitive and visual capabilities of humans. The main aim of the present study is to evaluate QOL of dwellers of residential units considering the role of relevant affecting factors in the apartments in which the fractal geometric skylights are utilized. The present investigation asks how light patterns in fractal geometry affect the QOL of residents of apartments. In this study, the rationalistic, argumentative (inductive, deductive), and scientific approaches are adopted. The present investigation has practical nature in answering its main question and its administration process includes a mixture of qualitative and quantitative approaches. In terms of objective, the present study is a descriptive, analytic, and interpretative so that the validity of findings would be assessed through rationalistic arguments and based on descriptive and analytical approaches. Data collection is carried out via both library and field research methods. In field research, university academic staffs who are expert in the field of research methods and also public comments (as residents of multi-floor apartments) are utilized by filling the questionnaires and conducting interviews with specific age and education target groups. Questionnaire, interviews and Microsoft Office Excel were used to evaluate the case samples. Conventional theories on light, skylights, fractal geometry and 8 samples of designed and implemented buildings in Tehran (as case samples completed after architecture competition movement in 2001) are taken as independent variables and the comments of dwellers of the mentioned buildings based on affecting factors on QOL are considered as dependent variables. Totally, the findings are classified under three categories of objective, subjective, and objective-subjective. Their indexes are also classified in separate tables and by utilizing Licker scale with the score ranges of 34 out of 40, 49 out of 55, and 46 out of 55, respectively. Finally, regarding the content of the research , and based on the high scores gained from positive comments of dwellers in most of the evaluated items it is concluded that windows and skylights in which the fractal geometry is used has positive effects on the QOL of residents and can also promote their QOL if implemented. It is necessary to mention that, items such as "construction, repair, and maintenance costs" and its relevant indexes in objective group and "space continuity" in subjective group, and "resistance to natural disasters" in objective-subjective category are the weak points of the present investigation as commented by residents. Thus, it is necessary to develop strategies to resolve the present demerits of these skylights as well as maintain their positive aspects.

Keyword: Optical pattern, Quality of life, Residents, Residential unit, Fractal geometry.

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