# Harmony in Indoor/Outdoor Context in the Architecture of 21<sup>st</sup> Century Schools

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Abstract. Mankind has recognised the damage brought upon the nature and is looking for ways to amend it. The nature and its importance in modern human lives have become even more significant and affect all areas of life including environmental art. The present research addresses the development of school architecture in  $20^{th}-21^{st}$  centuries and confirms the general social and, accordingly, architectural trend toward openness and harmony with nature. Abundant use of curved and multifaceted glazed surfaces on vertical and horizontal planes of exterior building walls makes integration of indoor and outdoor space very visible. When analysing environmental harmony in school interiors one may see that a most essential condition for indoor-outdoor harmony is a presence of a landscaped greenbelt. In order to take practical steps on the way to harmonious environments in school buildings and other objects, according to their function, as well as in towns and cities in general, long-term urban greening development and preservation plans should be as detailed as possible and their implementation should be established in the law. This would help in reaching better results in harmonious environment development.

Keywords: harmony, outdoor space, indoor space, glass systems.

## Introduction

Subject's relevance and explanation

In the 21<sup>st</sup> century technologies have brought rapid changes in modern urban space. Glazed facades have transformed cultural historic urban landscapes in architectural, energy efficiency and communication aspects. As glazed facades help to dissolve barriers between indoor and outdoor space, direct communication between the two forms. In Latvian climate, with insufficient optimum lighting and insolation of rooms in winter period, glass systems are a prospective construction material from energy efficiency point of view. The latest technological achievements provide a possibility to insert heating elements in glass systems, and they may be equipped with cooling facilities as well. Effective methods have been found for care and maintenance of glass systems. This has opened up new impressive opportunities in outdoor/indoor space design yet also established certain threats, or risk factors. Depending on the type of outdoor space, one may discern three large groups in joining outdoor/indoor space.

Architecture in a picturesque natural landscape. For example, a building at the sea, a river or a lake, in a meadow or forest, with glazed façade or fixed window with an open view nature-shaped landscape. We may be quite sure about environmental quality and harmony when indoor space connects to a picturesque natural landscape. In such cases the proposed objective almost always is achieved. The only thing left to do is, in designing stage, to carry out a timely and well-considered evaluation of possible seasonal changes of colour and mood. The most significant interspatial communication spot in this case is located indoors. The presence of nature mostly leaves a positive impact on the inner harmony of environment and people because the human being is a part of nature. The situation in urban environment is different.

Architecture in urban environment in which one has to count with the existing urban situation, imposes a double load. In this case the viewing direction goes from indoors to outdoors and the other way round. The second option is as much important as the first one. The third option should be mentioned, too: the use of plate glass in glazed facades from exterior side. In this case glazed mass acts as a multiplier and helps to increase green volumes of parks and historic and cultural environment optically. At building design it is important to evaluate not only the impact of urban environment upon interior decoration, but also how building's content and function will expose itself in outdoor space, i.e. urban environment. Such interspatial communication imparts significant responsibility upon creators of environment not only from the aesthetic but also psychological aspect of harmony. One of risk factors is a non-evaluated and unbalanced application of glass systems in environment architecture in relation to Latvian mentality: comparing to a European citizen, an average Latvian is more introvert, unsociable and, in a psychological sense, still under the spell of communistic genocide consequences. Society in Latvia still needs time in order to get rid of fear and to accept the openness offered by the new glass systems architecture step by step.

Proportionally, the most significant part of environment design situations are cases when we

can design outdoor/indoor space in correspondence with the building's function and established programme. Those buildings have adjacent land territories. Possibilities of harmonious development are extensive in such cases however the know-how in Latvian situation is insufficient.

## The bottleneck of previous research

"Issues of public outdoor space system development and aspects characterising its quality up to now have not been among the primary focus of research. Also, the problems of regenerating historic environment's outdoor space and structure of building development plan have up to now been mainly addressed from the aspect of historic and modern stylistics of architecture, overlooking the issue of how reconstruction of historically very significant objects might influence environmental quality as to its recreativity [1]."

relation In to interspatial communication, the art of Chinese and Japanese gardens possesses well-cultivated traditions in creating harmonious landscapes that may be viewed from inside through an opening. However, climatic, floristic and cultural differences do not let us use this method in Latvia; in the best case it may be done only indirectly. At present, there are no studies particularly addressing possibilities of harmonised outdoor/indoor space development. The situation is even more dramatized by the heritage of soviet times, both due to the quality of construction process and the low morals of society in reference to the collective living space. Society takes a relatively good care of everyone's private environment, yet does not find it possible to invest equal effort in maintaining the common life space, and education institutions may be able to encourage positive attitudes in this aspect. These problems create a necessity to develop a set of measures in order to further public development including studies of outdoor/indoor harmony development options in particular settings, and possibilities of a practical application of such harmony. In a long term, this would help to create a humane, friendly environment for a city dweller of any age to live happily, work and raise up seed. The possibilities offered today by the European Union set new requirements to Latvian education system, too, obliging it to prepare not only globally competitive specialists but also an inclusive society.

## Aim of research

Because the hypothesis of research already addresses the statement that, within 21st century technologies, a new architectural landscape is evolving, it is important to study the interaction of outdoor/indoor compositional elements through a glass system and the importance of its context in the spatial development of modern environment, landscape architects and to bring out the possibilities of harmony development in the conditions of Latvia. It is the basis

for developing a successful cooperation of architects/interior designers, and the results of this cooperation, on their part, depend on theoretical and ideological approach to the tasks of architectural design process. At present it is very important because landscape architecture is still new and the principles of outdoor/indoor interaction and their ideological development, or future vision, are unclear. This aspect has been insufficiently studied: earlier there was no clear necessity for it. Now it is important that, as a result of a general commercial pressure, environmental balance were not upheaved but, on the other way round, improved and developed further. Important sources of harmony development in interspatial context are the many objects already built.

Basic standpoints of the present work are vested in the main political strategies of Latvia [11]:

- 1) participation in the European Union and, consequently, striving towards European standards;
- 2) belonging of Latvia to Northern European, or Baltic, sea region and looking for common ties in the area of residential building development.

#### **Materials and Methods**

Classic i.e. comparative (or, informative) architectural research was chosen as the main method. It helps to gather an extensive informational material on built objects and to make a precise exposition of the essence of the theme under research, i.e. interaction of spaces through glass systems and make conclusions by help of visual comparison. This, on its part, is the basis for making further conclusions on possibilities of development of harmony in the future. One shall also employ auxiliary methods graphoanalystic method, analysis of photographic materials and sociological inquiries comparisons of data obtained.

# **Results and discussion**

Architecture today offers a very rich assortment of research material; therefore, within the limits of the present article, we will touch only upon the main tendencies of this aspect illustrating it with typical examples.

Employment of indirect and reflected light in architecture and interiors should be mentioned as one of the ways how outdoor/indoor harmony is expressed.

It is achieved by employment of light shafts, refracted and collapsed glass systems, and mirrors in architecture. These techniques are virtuously used by Gunnar Birkerts (1925), a prominent architect of Latvian origin in the United States who designed

and built buildings that gained popularity in the world, especially due to employment of indirect light systems in architecture. He also patented this system in his time.

The concept is already here
I search for words to express it.
It is the methaphor of glass
Appropriate
Free flowing and amorphous
When heated it the glory hole.
Crystalline and structured when cold
and formed.
The perimeter envelope is analogous to
the amorphous
The interior supporting srtucture
expresive
of the order
of the crystal.
Great contrasts.

(Gunnar Birkerts' poetic metaphor dedicated to the Corning Museum of Glass) [1].

Birkert's creative work proves that outdoor/indoor harmony is possible to achieve not only on above ground level but also between underground spaces and above ground. As the theme of this research relates to schools, his designed Lincoln Elementary School in Columbus, Indiana, 1965 (1967) should be mentioned as example.

The closed central part of this school is lighted on two levels by using indirect light system, innovative for the time [2]. Indirect daylight fills the space with a velvety radiance; such lighting is recognised to be more suitable for learning process than direct light because sunrays and the view from window do not hinder the concentration of children.

Another school building designed by Birkerts, Lillibridge Elementary School Addition, Detroit, Michigan, 1962 (1963), convinces that one may come close to harmony if the light enters the room in a direct way as well, but only through glass systems situated high above ground. Communication, or the angle of view, in such cases, looking from inside to outdoor landscape, does not touch the ground [3]. Interior space is filled with a gentle breeze-like light.

Light in itself is an absolute value and its use as the only communication means between indoors and outdoors makes it possible to approach harmony; this is proved by extremely many architectural objects in the whole world. M. Kundziņš (1936), a long-term teacher of the Functional Design Department of the Art Academy of Latvia who developed a bionics course for artists and taught it in the Academy from 1980 to 2004, summarised his knowledge in the book "Dabas formu estētika" ("Aesthetics of Natural Forms", 2008).

The present work sums up the criteria of harmony analysis. In accordance to M.Kundziņš' observations harmony may be described mathematically, proved geometrically with golden section, substantiated by colour coordination, correspondence of forms, bonding of nature and art, and also the unity of the man's emotionality and spirituality with the nature's In his designing process Gunnar Birkerts goes deeper than laws by the set mind and consciousness. In autumn of 1983, in the University of Illinois, Birkerts announced: "After many years of work, done according to methodologies of my teachers where academic approach to designing, i.e. problem solving, largely took over, I have recently liberated myself from theories and methodologies and, without the least of doubt, accepted the strong influence of intuition upon the process of creation [4]."

This, probably, opened the source for the growth and fruitfulness of Birkerts' creative work. Consequently, here his investment in school architecture should be mentioned: award of the American Institute of Architects for Cornell University Uris Library Addition Itaca, New York, 1980 (19820) [6], University of Iowa College of Law Iowa City, Iowa, 1979 (1986) [5] and a number of outstanding libraries playing an important role in education process as such.

As a second way of the manifold expression of outdoor/indoor harmony one should mention windows that serve not only as a source of light, but, in successful cases, also as frames of a picturesque landscape. Historic origins of this method can be found already in the art of ancient Chinese and Japanese gardens; naturally, window openings were not glazed due to privileged conditions set by those specific climates.

In comparison to the historic heritage, the spirit and trends of the present century are graphically characterised by the new extension of the Art Academy of Latvia in Rīga, 13 Kalpaka Boulevard 2010 (2012), designed by SZK un Partneri), in contrast with the historic building block designed by architect Wilhelm Bockslaff at the start of the 20<sup>th</sup> century, initially for the needs of the Commercial School of Rīga Stock Exchange. The majestic architecture of the historic building designed in the forms of romantic eclecticism, its interior, abundantly decorated with art nouveau details and ornamental stained glass, declares an indisposition for an outdoor/indoor dialogue (Fig. 1). The interior decoration's essence integrates well into the human-created one and expresses a frozen selfsatisfaction (Fig. 2). The new extension, on its part, accentuates the openness of indoor space to the outdoors, its dynamics and transformations, seasons

of the year changing (Fig. 3). This architecture confirms a general tendency of this age – the man is looking for a way back to the nature and harmony. The adjacent park's presence has been successfully employed in outdoor/indoor dialogue here. By help of a ramp, the window to nature has, in a way, assumed culminating looks, something like "the light at the end of a tunnel". Paradoxically, one should still admit that this window opening, not corresponding to the classic beauty standard, i.e. proportions of the golden section, ideally

frames the dark, naked silhouettes of old trees on the background of a blue sky shining in the March sun.

The architect has not intended to stay here, and the nature, hurriedly passing the man, can only lightly caress him. However, for a city dweller, unpampered by the nature, and especially for a becoming artist, this is a powerful source of inspiration. In contrast to a brutally-finished wall plaster the window towards the nature seems like peeping into a paradise.



Fig. 1. New addition of the Art Academy of Latvia designed by SZK and partners. Facades, view from building's backyard [Source: photo from author's private archives].



Fig. 2. View of staircase design in the historic block of the Art Academy of Latvia [Source: photo from author's private archives].



Fig. 3. View of interior design in the new addition of the Art Academy – entrance ramp [Source: photo from author's private archives].

The third type of outdoor/indoor harmony one should mention is employment of large glazed surfaces in the architecture of schools joining and transit areas with recreation a picturesque natural outdoor landscape. A graphic example is the new addition of Jelgava Secondary School No. 4 designed by architect A. Ziemelniece. An effective means of artistic expression in this case is the convex part of the glazed façade that allows nature to be a part of interior decoration in a much stronger way than it would be in the case of a linear glazed façade (Fig. 4; 5 and 6). For primary school children in their short study breaks it helps to feel the calming touch of nature, to gain strength for the next class and to preserve inner balance in a situation of tension or competition. Interior colour palette is harmonious, too: warm orange colours dominate in contrast to north-west orientation of the glazed façade part. The sun rays penetrate this building part in the evening when studies at school are already over and direct sunlight does not upset anyone. In such well-considered architectural design no additional expenses for sunblind purchase are necessary. A dialogue with the outdoor space involving a garden in the school's backyard,

is present also in the dining room's addition. An analogous approach, or a testimony to the characteristics of this age, is employed in the recently built International School of Latvia, 2009 (2010), in Piņķi, Babītes region, 2 Meistaru street (Fig. 7 and 8).

Project's authors, architects D. Zalāne and A. Roķis, have made the following comment on the harmony of outdoor/indoor dialogue:

"Indoors and outdoors of the International School are visually integrated, with the aim to create a sense of common space with two functionally different areas - indoors dominated by study function, and outdoors dominated by rest function. Technically speaking, it has been achieved by adjoining indoor atrium with the external front yard with a voluminous glass surface in the height of two levels. Studies and leisure time have been conceptually 'united', focusing them around a visually united common space with atrium and backyard, creating a feeling of them flowing into each other. Entering the school is designed with an overhang adjoining front yard's area and organically leading pupils into the building's main part – atrium, the focus of the school's life" [12].



Fig. 4. Facades of Jelgava Secondary School No. 4, architect A. Ziemeļniece [Source: photo from author's private archives].



Fig. 5. Foyer of Jelgava Secondary School No. 4, architect A. Ziemeļniece [Source: photo from author's private archives].



Fig. 6. Foyer of Jelgava Secondary School No. 4, architect A. Ziemeļniece [Source: photo from author's private archives].



Fig. 7. International School in Piņķi, Babītes parish, architects D. Zalāne, A. Roķis. Facades [Source: http://www.zalane.lv/lv/projekti/publiskas-ekas/48-latvijas-starptautiska-skola/full-gal-70-464/#imageLatvijas Starptautiskā skola].



Fig. 8. International School in Piņķi, Babītes parish, architects D. Zalāne, A. Roķis. Lobby design in dialogue with outdoor space [Source: http://www.zalane.lv/lv/projekti/publiskas-ekas/48-latvijas-starptautiska-skola/full-gal-70-464/#imageLatvijas Starptautiskā skola].



Fig. 9. View form interior upon atrium in a building of the Faculty of rural engineers designed in soviet time [Source: photo from author's private archive].

The third subtype of outdoor/indoor harmony one should mention is standard designs for the needs of higher education institutions developed in soviet times. The block of the Rural Engineering Faculty University of Latvia, Agricultural of the with analogous designs all over the former soviet territory, may serve as a characteristic example. There, architects offered a possibility to make a harmonious link between outdoors and indoors by creating a glazed atrium with a beautiful garden. By embracing atrium with ground floor lobby, in the transit zone one may feel a touch of nature (Fig. 9). The movement easily slides past an artificially grown, well-tended natural landscape in miniature.

An example of a most intensive outdoor / indoor communication and a testimony of a general tendency is reflected in the new Swedish Openspace school [8]. It is built in Stockholm and is the first school where classrooms have no walls. The school is a logical follow-up to the Nordic education system winning always more followers in the whole world thanks to its treatment of pupils. The aim of this education system is to bring up a free, harmonious personality in the spirit of cooperation, in contrast to the ruling system which produces "parts for the big machineries of the world".

## Conclusion

Results obtained in the present research confirm the proposed hypothesis that the development of outdoor/indoor harmony, within technologies of the 20<sup>th</sup> - 21<sup>st</sup> century, form a new space with landscaped architecture. The observed tendency of openness is still following an upward curve and addresses many areas of social life. Therefore, a harmonious outdoor/indoor dialogue should be granted an important role based on theoretical viewpoints stemming from advanced interdisciplinary research. One the most important indicators of society development are its education system and school architecture subordinated to it. The existence of described tendencies is proved by a research made on the architecture of school buildings. Proportion of glazed facades and window opening areas gets increased in relation to floor area in corresponding indoor rooms. Diversity of employed glazed surface forms enforces outdoor/indoor communication, too. Thus, for example, employment of convex or broken multifaceted glazed surfaces integrates the nature, or urban environment, in interior designs. It makes the dialogue between outdoor and indoor space gain an unprecedented echo. The said research confirms that mankind is intensively searching for the way back to nature, peace and harmony, in step with scientific achievements.

In the building's rectangular perimeter one has planted an expressive interior design, open to outdoor space not only through glazed facades but also through voluminous glass systems in ceiling, thus breaking down the traditional sense of the room as a cage-like place. The man, being a part of nature, is looking for the way to a spiritual and physical balance, or harmony. "The existing education system is not able to ensure the growth of personality. The volume harmonious information accumulated by mankind has created a situation when since early childhood certain branches of learning are divided into several paths. One of them is followed by scientists, another one – by artists, and both seem totally different ...

Those are ways of learning about the world, the rational and the emotional way. After all, the man is a whole, with his own mind and feelings. For a harmonious personality, interaction with the world gives a chance to perceive all types of information and to look upon all things and phenomena in their interconnection" [10].

Because environment creation is a long-term project (bigger trees, for example, reach maturity in 30-50 years) I believe that long-term urban development projects should include as detailed greening expansion vision as possible. City landscape architects-in-chief, on their part, and their subordinate administrative structures should strictly follow that certain projects be integrated in and not disharmonized with common urban greening projects. Such a farsighted strategy would provide a chance to improve not only architectural landscapes in cities, their ethical and esthetical quality and silhouettes, but also indoor space quality, because both spaces have become closely linked. Architects and interior designers, on their part, would have a chance to use such a greening expansion plan as a basis for their work and create harmonious environments taking into account existing and envisioned landscapes of this plan. This would be a practical step on the way to harmony between outdoor and indoor spaces.

#### References

- Bratuškins, U. Vecrīgas publisko ārtelpu attīstība XX un XXI gadsimtā. Promocijas darba kopsavilkums. Rīga: RTU Izdevniecība, 2006, 5. lpp.
- 2. Čaklais, M. Gaismas kungs jeb sāga par Gunaru Birkertu. Rīga: Pētergailis, 2002, 8.-9. lpp.
- 3. Čaklais, M. Gaismas kungs jeb sāga par Gunaru Birkertu. Rīga: Pētergailis, 2002, 170. lpp.
- 4. Kaiser, K. The Architecture of Gunnar Birkerts. Italy, Florence, Centro Di della Edifimi s.r.l., 1989, p. 54-55.
- 5. Kaiser, K. The Architecture of Gunnar Birkerts. Italy, Florence, Centro Di della Edifimi s.r.l., 1989, p. 38.
- 6. Kaiser, K. The Architecture of Gunnar Birkerts. Italy, Florence, Centro Di della Edifimi s.r.l.,1989, p. 108-115.
- Kaiser, K. The Architecture of Gunnar Birkerts. Italy, Florence, Centro Di della Edifimi s.r.l., 1989, ISBN 88-7038-172-2, p. 121-123.
- 8. *Как выглядит новая шведская "школа без стен"* [online 7.03.2013]. http://rus.delfi.lv/news/daily/abroad/foto-kak-vyglyadit-novaya-shvedskaya-shkola-bez-sten.d?id=43196544
- Kimberly, E. Geometry of Design. Studies in Proportion and Composition. Princeton Architectural Press, New York, 2001, p. 6-7.
- 10. Kundziņš, M. Dabas formu estētika. Bionika un māksla. Rīga: Madris, 2008, 7. lpp.
- 11. **Treija, S.** *Dzīvojamās vides attīstība Rīgā*. Rīga: RTU Izdevniecība, 2006, 2. lpp.
- 12. Zalāne, D. Personal comunikation, 2013.

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Kopsavilkums. Harmonija - saskaņa, samērīgums (krāsu toņu harmonija; harmonija arhitektūrā; cilvēka iekšējā harmonija). Šajā rakstā tika analizēta izglītības iestāžu ārtelpas un iekštelpas harmonija mūsdienu arhitektūrā, kuras izteiksmes veidu, materiālu un formu iemieso apjoma ziņā pieaugošu stikloto plakņu pielietojums būvmākslā. Stikls kļuvis par neizsmeļamu iedvesmas avotu arhitektiem, interjēristiem, māksliniekiem un, pateicoties savām fiziskajām, emocinālajām, psiholoģiskajām īpašībām, sniedzis plašas iespējas ēku veidošanas mākslā. Stiklotas plaknes, lietotas plašā dimensiju spektrā, kļuvušas par mūsdienu arhitektūras un pilsētvides neatņemamu sastāvdaļu, veido jaunu arhitektoniski ainavisku telpu. Tomēr, lai pēc trīsdesmit vai piecdesmit gadiem nebūtu bēdīgi jāsecina, ka šādā vidē mēs nevaram dzīvot, savlaicīgi tiek pētīts un analizēts pozitīvais un negatīvais šīs tendences pienesums kopējā dzīves telpā. Tas pavēris gan jaunas, grandiozas iespējas telpu veidošanas jomā, gan radījis arī zināmus draudus jeb riska faktorus. Svarīgi augšminētajā ilgtermiņa mākslas veidā nenokavēt brīdi, apstāties un uzdot sabiedrībai, ekspertiem un administrācijas pārstāvjiem retorisko jautājumu:"Quo vadis?".

Atkarībā no ārtelpas tipa ir izdalāmas trīs lielas grupas ārtelpas un iekšteplas savienošanā. Pirmkārt, arhitektūra gleznainā dabas ainavā. Piemēram, pie jūras, upes, ezera, pļavā vai mežā būvēta ēka ar stikotu fasādi vai vitrīnas tipa logu ar atvērtu skatu uz dabas veidotu ainavu. Mēs varam justies lielā mērā droši par vides kvalitāti un harmoniju, ja tiek savienota iekštelpa ar gleznainu dabas ainavu. Šādos gadījumos gandrīz vienmēr izvirzītais uzdevums sasniedz mērķi. Otrkārt, arhitektūra urbānā vidē, kurā jārēķinās ar esošo situāciju pilsētvidē. Treškārt, arhitektūras un ārtelpas vienlaicīga jaunrade atbilstoši ēkas funkcijai un uzstādītajiem mērķiem. Tiešu pētījumu par ārtelpas un iekštelpas harmonijas attīstības iespējām Latvijā pagaidām nav. Situāciju dramatisku padara padomju laikos atstātais mantojums gan ar savu izpildījuma kvalitāti, gan sabiedrības zemo morāles līmeni attiecībā pret kolektīvo dzīves telpu. Tā kā XXI gadsimta tehnoloģiju ietvoros veidojas jauna arhitektoniski ainaviska telpa, tad ir svarīgi izpētīt ārtelpas un iekštelpas kompozīcijas elementu mijiedarbību caur stiklotu plakni un tās konteksta nozīmi mūsdienu vides telpiskajā attīstībā, izkristalizēt harmonijas attīstības iespējas. Tas ir pamats, uz kura attīstīt ainavu arhitektu-arhitektu-interjeristu veiksmīgu sadarbību, kuras darba augļi savukārt secīgi ir atkarīgi no projektēšanas uzdevumu teorētiskajām un idejiskajām pamatnostādnēm. Kā viens no ārtelpas un iekštelpas harmonijas izpausmes veidiem, jāmin netiešās un atstarotās gaismas pielietojums arhitektūrā un interjēros. Kā otrs harmonijas daudzveidīgās izpausmas veids starp ārtelpu un iekštelpu jāmin aile, kas kalpo ne tikai kā gaismas avots, bet arī kā ierāmējums gleznainai ainavai veiksmīgos gadījumos. Kā trešais ārtelpas un iekštelpas harmonijas veids jāmin lielu stiklotu plakņu pielietojums izglītības iestāžu arhitektūrā, kas savieno interjera rekreācijas un tranzītzonas ar gleznainu dabas ainavu ārtelpā. Kā trešā virziena paveids - veidojot stikotu ātriju ar skaistu dārzu, harmoniski sasaistīt ārtelpu un iekštelpu. Aprakstītajā pētījumā tika analizēts ārtelpas - iekštelpas komunikācijas veids un harmonijas faktors tajā. Analizējot harmoniju ar salīdzinošo foto un grafoanalītisko metodi kā arī apsekošanu dabā tika pētīti tās noteicošie faktori: arhitektoniskais veids kādā ārtelpa komunicē ar interjeru, forma, krāsa, proporcijas, cilvēku psiholoģiskās likumsakarības u.c. Kopumā pētījums apstiprina, ka latviešu arhitektu darbos, kas projektēti izglītības iestāžu vajadzībām 20.-21. gadsimtā pieaug ārtelpas-iekštelpas savstarpēja integrācija, pateicoties dauzveidīgam stikloto plaknu pielietojumam arhitektūrā un vispārējam tendencēm vides mākslā. Ēku stikloto fasāžu un ailu laukumu proporcija palielinās attiecībā prêt attiecīgo iekštelpu grīdu laukumiem. Arī pielietoto stikloto plakņu formu daudzveidība pastiprina ārtelpas un iekštelpas komunikāciju. Tā piemēram – uz ārpusi izliektu vai lauzītu,

daudzšķautnainu stiklotu plakņu pielietojums integrē interjēros dabu vai urbānu vidi. Tas nozīmē, ka dialogs starp ārtelpu un iekštelpu iegūst vēl nebijušu rezonansi. Tā kā vides veidošana ir ilgtermiņa projekts, piemēram, lielie koki sasniedz savu briedumu 30-50 gados, uzskatu, ka ilgtermiņa pilsētvides attīstības projektos būtu jāizstrādā un jāiekļauj iespējami detalizētāka apzaļumošanas attīstības vīzija. Savukārt pilsētu galvenajiem ainavu arhitektiem un tam pakļautām pārvaldes struktūrām būtu strikti jāseko, lai atsevišķi projekti iekļautos kopējā pilsētvides apzaļumošanas projektā, nevis disharmonētu ar to. Šāda tālredzīga stratēģija pavērtu iespēju uzlabot ne tikai pilsētu arhitektoniski ainavisko tēlu, tā ētisko un estētisko kvalitāti, siluetu, bet arī iekštelpu kvalitāti, jo tās kļuvušas savā starpā cieši saistītas. Savukārt arhitektiem un interjēristiem būtu iespēja balstīties savā darbībā uz šādu apzaļumošanas attīstības plānu un izmantot maksimāli lietderīgi tā esošo un paredzamo skaistumu savos darbos, veidojot harmonisku vidi. Tas būtu praktisks solis ceļā uz ārtelpas un iekštelpas harmoniju.