This is a peer-reviewed, accepted author manuscript of the following research article: Maturana, B., Salama, A. M., & McInneny, A. (2021). Architecture, urbanism and health in a post-pandemic virtual world. Archnet-IJAR, 15(1). https://doi.org/10.1108/ARCH-02-2021-0024

Architecture, Urbanism, and Health in a Post Pandemic Virtual World

Introduction

A world which is less and less governed by boundaries and more and more by connections requires the reconstruction of our understanding and knowledge of our environment and our cities. It calls call for a reconsideration of the ethical foundations of architecture, urbanism, and allied disciplines in this emerging world order. This special edition of Archnet-IJAR attracted an overwhelming and profound response from colleagues across the world with more than 70 papers submitted in response to our June 2020 call for contributions. The perspective from around the world on the global pandemic, as it relates to the built environment, has been a privilege to review and reflect upon.

Following our rigorous double blind review process, 15 papers have been identified as the most suited to the focus and scope we have identified in the initial call, in addition to their qualities in terms of standard academic research and publishing. These selected papers are developed by more than 35 scholars, educators, and practitioners from 12 countries including Australia, Canada, Egypt, India, Indonesia, Portugal, Qatar, Saudi Arabia, Sweden, Turkey, United Kingdom. While some contributions speak to the particularities of their contexts, others address regional or global parameters. Despite this, two dominant themes have surfaced.

The first theme is the accelerated adoption of digital, online and distance technologies in architectural pedagogy, education in general, employment, business, commerce, services, and leisure. This is touched upon in each paper by stealth of COVID.

The second theme is adaptive architectural and urbanism design needed to address and contribute to a new normal. "*'Stay at home' for addressing COVID-19 protocol: learning from the traditional Balinese house"* (Putra, 2020) summarises the social distance message and looks to traditional housing for a design approach that unconsciously pre-empts the control of infectious diseases through health and wellbeing and culture.

At the intersection of the two themes is the University campus. *"Speculations on the post-pandemic university campus – a global inquiry"* (Deshmukh, 2021) sets the global context for the engine of the global knowledge economy. *"An evaluation of online architectural design studios during COVID-19 outbreak"* (Ceylan et al., 2020) addresses the unique social-spatial aspects of architectural pedagogy. *"COVID-19 responsive teaching of undergraduate architecture programs in India: learnings for post-pandemic education"* (Varma and Jafri, 2020) provides a teacher's insight in addressing the vexed acceleration of digital-online education particular to architecture.

The pandemic condition as it relates to the built environment

The role of architectural practice and pedagogy to respond, shape and rebuild a new normal consolidates the issues for living in a post COVID-19 urban century. They were pre-empted. In 2014, former US President Barak Obama issued an unheeded warning to address the threat of wild animal and food handling to urban environments. In 2018, the global climate crisis of drought, manifest in the capital of South Africa of Johannesburg, created the first capital city without water. In 2019, forest fires raged, and social crises were signalled in the capital cities of three economic success stories of their region: Paris in Europe, Hong Kong in Asia, and Santiago in America.

COVID 19 restrictions transformed the places of work, study, commerce, and leisure. For the multi-use of work/education, commerce/leisure and private/public space, architecture was forced to adapt, be adapted by the user and designer alike. The public-private response to the pandemic rapidly consolidated contemporary issues of health, urbanism, and architecture.

On 19 December 2019, the global health crisis spread to every capital city, intermediate city and small-town. It forced governments, businesses, academics, professional and workers to invent new ways for all of society to function while controlling the spread of the disease and finding a vaccine. The ongoing task was, and is, to establish what has been called the *new normal.*

The professions, pedagogies and practices of architecture have identified the design problem and created new uses and designs of the spaces between buildings and the buildings themselves. While acknowledging the seriousness and magnitude of the problem the world faces, the papers in this special edition of the journal have generated an overwhelmingly constructive perspective on a new normal.

The accelerated adoption of online, digital and distance technologies has forced the disciplines of the built environment to tackle the technology/design/spatial experience triadic of architecture and urbanism in an immediate way, through pedagogy, practice, and research. The interrelated impact and instant feedback of this adaptation in work/study, leisure and private life has created ways to embrace an uncertain future. The greatest lessons for business, government and citizens from an a-normality have been demonstrated in new forms of co-operation between science, technology and society that has glimpsed a possible third way to a new and better normal.

Analytical reflections on the emerging themes

The contributors to this edition of Archnet-IJAR have analysed, hypothesised, and tested methods, structures, and content of effective and enhanced online and distance education. This approach capitalises on the virtual collapsing of distance, the saved energy and time in travel, the curious advantages, and disadvantages of personalised teaching of students in their homes/local educational facilities and the flipsides to these questions—private life and living conditions entering the online university campus and collective daily life.

Design Studio Teaching remains at the centre of architectural pedagogy and at the centre of the question of the accelerated adoption of digital, online and distance technologies. The "inevitable" move to the virtual world is most clearly illustrated by Design Studio Teaching. *"Architecture students' satisfaction with and perceptions of online design studios during COVID-19 lockdown: the case of Jordan universities" (*Alnusairat, et al., 2020) looks at the value which first year students give to hand drawing, model making and presential studio teaching compared to fourth year students.

The adaptative and redesign of architectural and urban projects covers a range of social-spatial question of equity, access, and social justice in the design of cities, public spaces, homes, and institutional buildings. Some contributors have taken their quarantined urban-daily reality and routine as live case studies. *"Questioning the use of the balcony in apartments during the COVID-19 pandemic process"* (Aydin and Sayar, 2020) examines this in-between architectural space for its public-private, domestic-work socialising-health potentials and pitfalls. Other contributors examine the housing crisis through the fastest growing form of housing. *"How our homes impact our health: using a COVID-19 informed approach to examine urban apartment housing"* (Peters and Halleran, 2020) looks at the quality of life in mid to high rise apartments and the rights

to light (and air) as a pre and post COVID health concern. The adaptation or rebuild of facilities becomes a question for post COVID architectural practice. On the rebuilt and new design side *"Healthy BIM: the feasibility of integrating architecture health indicators using a building information model (BIM) computer system"* (Rice, 2020) assesses the contribution of building project management to this challenge.

The interrelated questions of the space between buildings, the interior of buildings themselves and the threshold between hold further questions of sustainable environment, a just society, and a sustainable economy. The accelerated adoption of working from home, as a viable long-term approach to employment, presents each of these design questions to housing, infrastructure, public space and institutional, office and commercial buildings. *Beyond the pandemic: the role of the built environment in supporting people with disabilities work life (*Martel et al., 2021) looks to the successes and failures of universal access in city design. The contemporary approaches that address work, home, leisure, and mobility as a relationship augmented by digital, online, and virtual spatial relationship holds a critical pre COVID 19 lesson in citizenship. The sustenance of family life under a new a better normal and housing design/adaptation/redesign is raised by a number of contributors. *"Social integration through social connection in everyday life. Residents' experiences during the COVID-19 pandemic in SällBo collaborative housing, Sweden"* (Arroyo et al., 2021) provides a unique case study of a young refugee/third aged housing development and the impact of social distancing imposed by the pandemic.

The quality of life in our homes and our cities—light, open space, privacy, air circulation—becomes complicated by COVID 19 but not unachievable and we need to know how we live, how we can adapt and of which habits, routines and customs will make our new normal better and which we cannot live without. *"Emerging living styles post-COVID-19: housing flexibility as a fundamental requirement for apartments in Jeddah"* (Bettaieb and Alsabban, 2020) examines the changing psychological, social, and cultural conditions enforced by COVID protocols and how they impact on existing and traditional spatial practices. In a similar vein, *"The fifth-place metamorphosis: the impact of the outbreak of COVID-19 on typologies of places in post-pandemic Cairo"* (Abd Elrahman, 2020) studies new living models of adaptive, spontaneous urban and architecture design tactics. *"The new normal or the forgotten normal: contesting COVID-19 impact on contemporary architecture and urbanism"* (Alraouf, 2021) interrogates the practice of architecture, urbanism and city planning before the COVID-19 and contests its responsibility towards the city and the community. This leaves us with the challenge of creating a new and better normal in the post-COVID era.

The imposed need for the adaptation, redesign and the new design of educational facilities questions many pedagogical assumptions and presents new challenges, new solutions. The audit and evaluation of existing building infrastructure for education must be the starting point. *"Design tactics for enhancing the adaptability of primary and middle schools to the new needs of postpandemic reuse"* (Güzelci et al., 2020) develops an assessment matrix for existing education facilities and building adaptation rather than rebuilt. As such it also addresses questions of social and environmental sustainability. For the forms and structures of administration for University Education and the design of the curriculum, *"Well-coordinated: learner-focused coordination tactics beyond the pandemergency"* (Soccio et al., 2020) provides a model for the pre and post COVID university through, and in, a student-centred teaching and learning approach.

University education, and architectural education in particular, the university campus, the public space and building design for presential teaching present a huge challenge. The tools and knowledge to assess what should be online become essential thinking tools for a new and better educational model. Teaching experience as well as student experience of the online campus must be kept in constant evaluation, modification, and betterment. These will be enhanced by the very tools that are the teaching medium and

method. *"An evaluation of online architectural design studios during COVID-19 outbreak"* (Ceylan et al., 2020) uses a qualitative approach to evaluate first, second, third-, and fourth-year students of architectural design studios during the COVID 19 learning environment.

Diversity and complexity: A trans-disciplinary built environment research in a post pandemic world

By and large, the breadth and depth of enquiry into architectural research, architectural education, and architectural design in this edition of Archnet-IJAR indicate some of the methods and tools to address the accelerated adoption, adaption and redesign needed to create a new and better normal which embeds flexibility and learning. The papers represent an excellent inauguration to address the momentous insinuations the covid-19 condition has on the built environment. The diversity of implications tells us much about potential alternative futures for urbanity and society and the associated education and practice of future built environment professions. In essence, the contributions invite us to critically envisage possibilities for future research and collective action within built-environment related disciplines.

The public health upheaval caused by coronavirus has generated significant impacts on societies, cities and settlements around the world. The complexity of the implications requires active engagement from various disciplines from an integrated transdisciplinary perspective where architects and urbanists play a major role. Operationalising ideas generated in design and planning discourse, trans-disciplinarity can be elucidated as a form of learning through action involving co-operation among different parts of society, professionals, and academia in order to meet complex challenges of society. Trans-disciplinary research starts from tangible problems. Solutions are devised in collaboration with multiple stakeholders, including academics and professionals from different disciplinary backgrounds (Doucet & Janssens, 2011). Transcending the boundaries of the various disciplines, as a mode of knowledge production, it can simultaneously confront complexity while challenging fragmentation of knowledge. Its hybrid nature and enables it to incorporate any academic disciplinary structure (Dunin-Woyseth & Nielsen, 2004; Lawrence & Depres, 2004). In essence, the implications of COVID-19 on architecture and urbanism represent a hybrid condition that requires hybrid modes of thinking and approaches to investigation.

Health and well-being, adaptation and appropriation in crisis situations such as this pandemic appear to be at the forefront of concerns at various scales and project types including buildings, public spaces, the public realm, university campuses, and residential environments. The development of healthy environments must be central to architecture and urbanism in the future; despite the absence of health as an important parameter within the education and practice of architecture and urban design and planning professions. Forsyth (2020) asserts this view and argues: "*For the past decades, those looking at the intersections of planning, design, and public health have focused less on infectious diseases and more on chronic disease, hazards and disasters, and the vulnerable*." Rice (2019) maintains that the design of the built environment is a determinant of health and thus there is an increasing need for greater synergy between architectural and urban education, research, and practice and public health.

The following is an ephemeral outline of three potential research areas that engage with various types of disciplinary knowledge which require a transdisciplinary thinking and, concomitantly, collective action. The topics are only examples inspired by various aspects addressed in this edition of Archnet-IJAR. Topics and areas are inclusive, and they can be elaborated upon, and expanded, adopted and adapted to speak to specific contextual challenges.

The first area is urban dynamics which deals with the implications of virus spread at the city scale as well as the wider global dimension. Key disciplines that would work together in this area include urban design, urban planning, human geography, transportation engineering, and public health. Vital topics under urban dynamics as they relate to virus spread and environmental health include:

- Emerging perceptions of urban density and designing for effective density management at a time of virus spread
- Urban peripheries and sprawl versus healthy urban centres
- Connectivity and enhanced policies for alternative forms of transit
- Urban mobility in relation to air pollution, carbon emissions, and mortality rates
- Access, space standards and emerging protocols for design and use of public facilities
- Impacts on, and potential intervention strategies in, slums, informal settlements, and urban poverty in the global south
- Impacts of paused/reduced global infrastructure and global interworks on cities
- Impacts on airport hubs and industrial place typologies as potential areas for virus spread

The second area deals with distancing measures which addresses how spatial and social distancing measures and protocols are altering our understanding of spatial design, especially at the urban spaces level. Key disciplines that would collaborate in this area to address relevant implications and generate new knowledge include architecture and urban design, environmental psychology, disaster psychology, and public health. Principal topics under the implications of distancing procedures resulting from various tiers and levels of intensity of measures include:

- Emerging standards for integrating health in public spaces and as a key constituent in understanding place
- The nature of future use of public spaces including spontaneous interactions, social control, passive/active engagement as they relate to personal and public health and safety
- Mitigation through Biophilic design standards, restorative environments and engagement with nature
- Emerging design standards addressing new measures of personal space, proximity relationships, healthy urban settings
- Potential seasonal migration patterns (the urban, the peripheral, and the rural)
- Emerging perceptions of geographical locations and place attachment within the city (home zone/range, workplaces, recreational environments, city centres)

The third area concerns itself with emerging patterns of living and working where the COVID condition has altered the nature of living and work from a state of isolation to one of integration of two types of use. This has substantial repercussions on current and future home environments and workplaces. Key disciplines that would work collaboratively in this area to address relevant implications and generate new knowledge include architecture, interior and urban design, architectural engineering, environmental psychology, various disciplines within social sciences (anthropology and ethnography); major topics include:

- Emerging standards of spatial environments that accommodate new living/working patterns
- Appropriation and adaptation (retrofitting) of the existing housing stock (and that which is under development) to meet emerging needs

- Standards and specifications for new residential environments
- Work-based life modes (wager-earner, career-oriented, self-employed) as determinants of designing future home environments
- Attitude based sub-cultures (within the larger society) competition and individualism, isolation and avoidance of social controls, equity and negotiation, as determinant of future housing choices.

The trans-disciplinary understanding of the implications, as they relate to knowledge production and future built environment research, would reveal important insights into the factors that will impact future education, research, and practice of architecture and urban design, with health and interconnectivity as key research drivers. As the spread of COVID-19 has influenced individuals, communities, organisations, and governments, its impacts will be on every level and scale from global networks and infrastructure to global cities and urban regions, and from residential neighbourhoods and public spaces to home and work environments and will continue for many years to come.

The spread of the disease generated a condition, which is characterised by human detachment, isolation, and engagement in a virtual world, coupled with an emphasis on working from home through the utilisation of information and telecommunication technologies. The necessity and acceptability of these new norms as a result of attempting to limit the disease spread appears to be a catalyst for future research. While addressing health in a post pandemic virtual world, negative consequences emerge where many people around the world will be living and working in confined spaces, surrounded by high-rise agglomerations, others will have the privilege of engaging with nature.

This condition we are now encountering was predicted, more than 15 years ago, as evident in the writings of theorists in architecture and urbanism. Manuel Castells in his book: The Rise of the Network Society: Economy, Society, and Culture (2000) developed a methodical theory of the information society, which is based on the overpowering impacts of information technology in a contemporary global world. His assumption that the global city is not necessarily a place, but a process seems to manifest in where we are the moment. The visionary trilogy of the late William Mitchell is clear evidence that where we are represents the prospects of our future built environment (Mitchell, 1995, 1999, 2003).

In an electronically connected world our cities, buildings, social practices are being reshaped and thus we must extend the definitions of built environment related disciplines to integrate virtual places as well as physical ones, and interconnection by means of telecommunication links as well as by pedestrian circulation and mechanized transportation systems. Strategies for the creation of cities that not only will be sustainable but also will make economic, social, and cultural sense in an electronically interconnected and global world will be important to interrogate and further develop, going forward.

References

Abd Elrahman, A.S. (2020), "The fifth-place metamorphosis: the impact of the outbreak of COVID-19 on typologies of places in post-pandemic Cairo", *Archnet-IJAR*, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/ARCH-05-2020-0095

Alnusairat, S., Al Maani, D. and Al-Jokhadar, A. (2020), "Architecture students' satisfaction with and perceptions of online design studios during COVID-19 lockdown: the case of Jordan universities", *Archnet-IJAR*, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/ARCH-09-2020-0195

Alraouf, A.A. (2021), "The new normal or the forgotten normal: contesting COVID-19 impact on contemporary architecture and urbanism", *Archnet-IJAR*, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/ARCH-10-2020-0249

Arroyo, I., Montesino, N., Johansson, E. and Yahia, M.W. (2021), "Social integration through social connection in everyday life. Residents' experiences during the COVID-19 pandemic in SällBo collaborative housing, Sweden", *Archnet-IJAR*, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/ARCH-10-2020-0236

Aydin, D. and Sayar, G. (2020), "Questioning the use of the balcony in apartments during the COVID-19 pandemic process", *Archnet-IJAR*, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/ARCH-09-2020-0202

Bettaieb, D.M. and Alsabban, R. (2020), "Emerging living styles post-COVID-19: housing flexibility as a fundamental requirement for apartments in Jeddah", *Archnet-IJAR*, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/ARCH-07-2020-0144

Castells M. (2002), *The rise of the network society: Economy, society, and culture*. Hoboken, NJ: Wiley-Blackwell.

Ceylan, S., Şahin, P., Seçmen, S., Somer, M.E. and Süher, K.H. (2020), "An evaluation of online architectural design studios during COVID-19 outbreak", *Archnet-IJAR*, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/ARCH-10-2020-0230

Deshmukh, J. (2021), "Speculations on the post-pandemic university campus – a global inquiry", *Archnet-IJAR*, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/ARCH-10-2020-0245

Doucet, I., & Janssens, N. (2011), "Transdisciplinarity, hybridization of knowledge production and space related research". In: I. Doucet & N. Janssens (eds.), *Transdisciplinary knowledge production in architecture and urbanism*. Heidelberg, Springer, pp. 1-14.

Dunnin-Woyseth, H., & Nielsen, M. (2004), "*Discussing transdisciplinarity: Making professions and the new mode of knowledge production*". The Nordic Reader, Oslo School of Architecture, Oslo.

Forsyth, A. (2020), "*What role do planning and design play in a pandemic*?" News – Harvard's Graduate School of Design (19 March 2020), https://www.gsd.harvard.edu/2020/03/what-role-do-planning-and-design-play-in-a-pandemic-ann-forsyth-reflects-on-covid-19s-impact-on-the-future-of-urban-life/ [Accessed: 28 January 2020].

Güzelci, O.Z., Şen Bayram, A.K., Alaçam, S., Güzelci, H., Akkuyu, E.I. and Şencan, İ. (2020), "Design tactics for enhancing the adaptability of primary and middle schools to the new needs of postpandemic reuse", *Archnet-IJAR*, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/ARCH-10-2020-0237

Lawrence, R., and Depres, C. (2004), "Futures of transdisciplinarity", *Futures*, Vol. 36 No. 4, pp. 397-405, https://doi.org/10.1016/j.futures.2003.10.005

Martel, A., Day, K., Jackson, M.A. and Kaushik, S. (2021), "Beyond the pandemic: the role of the built environment in supporting people with disabilities work life", *Archnet-IJAR*, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/ARCH-10-2020-0225

Mitchell W.J. (1995), *City of bits: space, place, and the infobahn*. Cambridge, MA: MIT Press.

Mitchell W.J. (1999), *E-Topia: Urban life, Jim—But not as we know it*. Cambridge, MA: MIT Press.

Mitchell W.J. (2003), *Me++: The cyborg self and the networked city*. Cambridge, MA: MIT Press.

Peters, T. and Halleran, A. (2020), "How our homes impact our health: using a COVID-19 informed approach to examine urban apartment housing", *Archnet-IJAR*, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/ARCH-08-2020-0159

Putra, I.D.G.A.D. (2020), ""Stay at home" for addressing COVID-19 protocol: learning from the traditional Balinese house", *Archnet-IJAR*, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/ARCH-09-2020-0187

Rice L., (2019), "The nature and extent of healthy architecture: The current state of progress", *Archnet-IJAR*, Vol 13 No 2, pp. 244–259. https://doi.org/10.1108/ARCH-11-2018-0005

Rice, L. (2020), "Healthy BIM: the feasibility of integrating architecture health indicators using a building information model (BIM) computer system", *Archnet-IJAR*, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/ARCH-07-2020-0133

Soccio, P., Tregloan, K. and Thompson, J. (2020), "Well-coordinated: learner-focused coordination tactics beyond the pandemergency", *Archnet-IJAR*, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/ARCH-10-2020-0227

Varma, A. and Jafri, M.S. (2020), "COVID-19 responsive teaching of undergraduate architecture programs in India: learnings for post-pandemic education", *Archnet-IJAR*, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/ARCH-10-2020-0234

Beatriz Maturana is associate professor and currently is the Director of the Institute of History and Heritage, Faculty of Architecture and Urbanism, University of Chile. Her research area is sustainable cities and urban integration. She is Adjunct Professor at RMIT University, Australia. She teaches in the areas of sustainable urban development & heritage and interventions in public space. Student supervision includes final projects and the co-supervision of international PhD candidates. She is an invited jurist, panellist, and editor for various international forums. Beatriz graduated in Architecture (RMIT University) and completed her Master of Urban Design and a PhD (University of Melbourne). In Australia she practised as an architect, urban designer and academic. She is the founder of Architects for Peace (www.architectsforpeace.org).

Ashraf M. Salama is professor of architecture and director of research and of the cluster of architecture and urbanism in the global south, Department of Architecture, University of Strathclyde, Glasgow, UK. He has led three schools of architecture in Egypt, Qatar, and the United Kingdom, two of which he has founded. His work and research have been focusing on sustainable architectural and urban design, with a strong emphasis on the impact of socio-cultural factors on shaping the built environment. Having authored and co-edited 14 books and published over 170 articles and chapters in the international refereed press Prof Salama is the recipient of the 2017 UIA Jean Tschumi Prize for Excellence in Architectural Education and Criticism.

Anthony McInneny is a visual artist, designer, academic and conjoint fellow at the School of Architecture and Built Environment, University of Newcastle, Australia. Between 2004-2014 he developed and delivered the studio teaching for the Master of Art, Art in Public Space program, RMIT Melbourne, Australia where he obtained his PhD (architecture) in 2014. In Melbourne he was commissioned for several public artworks. His research through practice concerns the contemporary forms and uses of the street, the plaza, and the park. Since 2014, he has lived and worked in Chile and has undertaken research, lectured, published, and exhibited about Santiago's public spaces.