Enabling Ideas for Inclusive Post-Pandemic Scenarios

Emilio Rossi [iD] [a] *

[a] University of Lincoln, Lincoln School of Design, Lincoln, United Kingdom
* Corresponding author: erossi@lincoln.ac.uk

ABSTRACT

The COVID-19 pandemic will be remembered as the most severe medical threat of last decades, which forced billions of people to live in isolation and alienating conditions while millions have lost their lives. So far, the design interventions created to contrast the pandemic have been largely focused on the design of products for personal use (i.e. PPE), which however will not be very effective in the long run. In post-pandemic scenarios, designers will be asked to create new enabling solutions to foster socially inclusive and sustainable 'new normalities'. These solutions will play a fundamental role in the transition toward future sustainable and inclusive living conditions. This paper proposes three inclusive-oriented design scenarios containing some promising design ideas conceived to enhance the social and sustainable qualities of living places and communities. Later, a number of promising testing grounds will be listed for immediate interventions in the post-pandemic's transition stages.

Keywords: COVID-19, Design for Social Inclusion, Design Scenarios, Enabling Ideas.

1. INTRODUCTION

The COVID-19 pandemic has produced drastic changes in the people's lifestyle globally. In few months, the number of people affected by severe medical symptoms exponentially increased, as well as the number of deaths; according to the last records, at the end of December 2020 the confirmed cases turned 73,000,000 and more than 1,600,000 people have lost their lives (JHU CRC, 2020). To date, the pandemic is still on-going and people are asked to keep high the attention to mitigate the spreading of the pandemic. However, to prevent the diffusion of the virus, many governments have adopted by law radical measures limiting the social interaction of individuals, including: closing of non-essential shops and productions, closing of schools and public areas, cancellation of recreational venues, closing of public places including non-essential national and international travels, social distancing, self-isolations, border closures, curfews, enforced remote working, stay-at-home orders and movement controls (Hale et al., 2020).

The reduction of individual freedom resulting from the adoption of these protection actions, together with the limitation of those elements assumed as basic needs, generated a wide and indirect sense of social exclusion, which caused marginalization, segregation, lack of access to basic services and resources of various kind, forces isolation, etc. Silver (2019) describes the social exclusion as 'a multidimensional relational process of severing social ties, preventing access to institutions, denying opportunities for social participation, and

impairing social cohesion and solidarity'. Accordingly, social exclusion reflects inequality, which is overcome through equal citizenship, democratic conflict resolution, or social rights. As documented by Sara Colombo and Paolo Ciuccarelli in 2020, new psychological, relational and emotional factors have been observed in people forced to live in the stay-at-home condition, for example: uncertain hope, fear, confusion, physical and emotional solitude, sadness, boredom and discouragement (Design for Emergency, 2020). These new factors, which are not part of the traditional taxonomy of social exclusion, have contributed in amplifying the disabling conditions of people during the lockdown. From the social point of view, it is possible to say that the COVID-19 pandemic has been one of the most sudden and important generators of social exclusion of last decades.The concept of social exclusion generates direct connections with design domains, by interpreting the relations between sociological aspects, psychophysical conditions and limited actions performed by people through the solutions they use. This link underlines the intrinsic limits of those solutions considered as 'social', 'accessible', 'inclusive' and 'for all' – i.e. products, technologies, networks, services, architectures, etc. – and, together, allow understanding how it will be possible to design, in the next post-pandemic scenarios, enabling solutions to boost socially inclusive living conditions. Thus, as can be deduced by EIDD (2004), solutions in line with the idea of social exclusion will be considered as 'disabling', while the ones in line with the idea of inclusion will be 'enabling'.

In this historical moment of coexistence with the risk of contagious, the 'inclusive power' of next generation of solutions will be one of the most important aspects to consider in order to mitigate the existing 'exclusive'[1] factors characterizing current living conditions, even the marginalised ones; besides, the present conditions could be used to reinterpret those factors considered hitherto inclusive. For example, it has been observed that boredom and discouragement have been amplified, and in some cases reinforced, by the lack of empathy and engagement with social networks and by poor contextual social stimuli during the delicate phase of adaptation and lifestyle reshaping; consequently, the intrinsic exclusivity of such solutions have amplified the perceived emotional aspects of functional segregation. It is possible to deduce that the pandemic has transformed some of the solutions designed to be social and inclusive into exclusive ones.

While the majority of the design interventions produced during the pandemic have been largely focused to the design of personal protection equipment (PPE) to mitigate the spreading of the virus, designers can now reflect on the role that enabling solutions will have in the post-emergency scenarios, when the risk of contagious will be lower. In these new scenarios, the design community will be asked to rethink new inclusive and sustainable ways of living by converging the potentialities of Design for Social Inclusion, useful to meet the new needs expressed of people during and after the crisis periods, with the sustainable conditions of future living places. Moreover, this hypothesis is consistent with the vision recently formulated by António Guterres, the ninth Secretary-General of the United Nations, in July 2020, which said: 'now is our chance to recover better, by building more resilient, inclusive and sustainable cities' (Guterres, 2020).

This paper aims to explore the possible inclusive ideas usable in the post-pandemic scenarios to support and sustain the transition toward future enabling living conditions. These enabling ideas, which are part of a wide vision of social and sustainable living, combine the Design for Social Inclusion insights with contemporary trends of Design for Sustainability. Accordingly, new inclusive-oriented design scenarios containing the enabling

design ideas will be drawn to enhance the social and the sustainable qualities of living places and communities.

2. INCLUSIVE-ORIENTED DESIGN SCENARIO AND ENABLING IDEAS

The idea of inclusive-oriented design scenario is consistent with the one discussed by Manzini, et al. (2009, p.15): 'a designable vision of something complex and articulated based on a clear motivation – what is the aim? – and a practicality – the actions to undertake to favour its implementation'. Accordingly, it is a powerful design element to be used to imagine future living conditions mixing bottom-up instances and top-down design strategies. In terms of motivation, the design scenario aims to imagine inclusive visions in the transition to post-pandemic sustainable living conditions, while the practicality focuses on the range of enabling solutions that will be possible to generate, when, whether and where needed, to mitigate future exclusive conditions at the personal and social dimension. Consequently, constrains of the scenario – i.e. stakeholders analysis, exploration of common goals, ideas generation – are coherent with the literature (Manzini, et al. 2009, p.16).

2.1. Shift in perspective and the need of new solutions

An important shift in perspective is required to set the basis of the inclusive-oriented design scenarios. In particular, three elements must be considered:

1. Seeing the emergency as an opportunity for creating positive changes, as well as optimistically facing the future interventions.

2. Evolving the design approach from problem solving to the opportunity development – creation of inclusive solutions and enabling conditions, which are an indirect result of the previous topic.

3. Considering the living ecosystems as systemically connected with systems and sub-systems of productive and social actors, with various grades of interdependencies.

Considering the emergency as an opportunity allows moving from a short-term perspective to a long-term one for any new enabling designable idea. The emergency has to be seen as a stimulus for rethinking the role of inclusive interventions in the way products and services can improve the people's quality of life within sustainable living environments. Finally, assuming the emergency as an opportunity implies to laterally think about the role of designers and their relationships with customers, markets, stakeholders and companies.

On the design point of view, this philosophical and ethical change must be reinforced by a new design attitude: moving toward the search of inclusive solutions. In a perspective of optimistic and positive change, designers must adopt a new approach more oriented to the open exploration of liveable conditions and contexts of use for all end-users. The systemic interdependency of social and productive actors is also fundamental for understanding, and later designing, the effects of the new solutions at the large scale maintaining the social inclusion as a strategic factor supporting bottom-up policies, holistic positions and co-design interventions.

The solutions and the strategic ideas developed within the new scenarios will be open, projected to the future and resilient to changes. They will refer to the real end-users' needs including their psychophysical and socio-relational capabilities, both positive (abilities) and

negative (disabilities). The solutions developed in these inclusive-oriented design scenarios – products, services, strategies, architectures, etc. – will be both enabling and inclusive, since working on new socially and sustainable living conditions.

2.2. Enabling ideas sustaining the inclusive-oriented design scenario

The inclusive-oriented design scenario is based on nine enabling ideas that support, using design-oriented relations, the social inclusion. The hypothesis sustained in this new research framework is that such ideas can generate, and later consolidate, design processes and promising long-lasting design conditions for new interventions in the post-pandemic scenarios and beyond. The ideas are also seen as promising design criteria usable by designers to design the next generation of enabling solutions.

Designing long-lasting solutions, rather than short-term interventions. As discussed before, the current emergency provides the opportunity to reflect on the long-term effects of solutions designed in the present times, especially the ones concerning the social impacts of products and services in the everyday life of people during exclusive circumstances (i.e. self-isolation). As documented by Goehrke (2020) and Stolton (2020), designing with a short-term projection is the natural consequence of the emergency; however this design behaviour could fail in the long run. In the post-pandemic scenarios, it will be important to convert the positive behavioural factors arose in the last months to qualitatively improve the inclusive aspects of the new solutions that later will be used by all end-users. The integration of these behavioural aspects will be both inclusive, because based on real people's expectations, psychophysical capabilities and needs, and sustainable, because they will support emotional and visceral aspects of the human-product interactions (see Jordan, 2000). From the design point of view, this self-feeding loop – combination of human needs and capabilities with sustainable behaviours – will be able to generate long-lasting enabling solutions.

Switching from functionalism to the generation of social connections. The abandonment of the functional design approach refers to the way designers think about new solutions to be introduced in the market, as well as vertical business-centred practices operated by companies. As the people's needs will be more dependent by the social power to connect with others, less tied with out-dated consuming ideas and in general more in line with the social capability to be linked with people and places, the future solutions must be designed to meet these bottom-up instances. The new solutions must evolve from the mere functionalism toward an accepted idea of 'inclusivity' and co-design with final end-users, allowing to considering the people's real needs as well as to increase the effectiveness of solutions in the markets (Donahue and Gheerawo, 2009). Accordingly, the social connections, and the how the new solutions will qualitatively increase these socio-relational links, will be important aspects to be used to rethink the next generation of enabling solution, sustainable business models, market and ways of consumption.

Designing for citizens and communities of people. The pandemic has underlined the inadequateness of many services and solutions when used by large-scale groups of people, which however have been originally designed for 'real' end-users. Indirectly, this ineffectiveness is related to the design conduct used by designers, which is still based on the traditional 'design for standard' approach. A radical shift is needed to convert the top-down design approach into bottom-up resilient practices, where end-users are intended as citizens and communities of people that collaborate in the design and in the implementation of the

enabling solutions they will use in the post-pandemic scenarios. Consequently, the 'design for standard' must to be abandoned in favour of a more holistic approach that consider the real characteristics of groups of people, including social, physical, age-related, psychological, anthropometric, sociological and economic features, both positive and negative. Considering expert and non-expert citizens as well as communities of people allows starting enabling processes of participation (see Manzini, 2015) and, consequently, the design of effective context-based inclusive solutions tailored on real needs.

Expanding the group of people to design for. The cultural shift on designing for new groups of end-users – citizens and communities of people – means designing for an extended group of people having complex psychophysical and socio-relational characteristics. This aspect recalls one of the most important lessons of Design for Social Inclusion (see EIDD, 2004). Therefore, the solutions designed for the post-pandemic scenarios must be conceived both for extended groups of people, having complex relational and systemic connections with other groups of people; they also must be designed for children, sensitive groups of people, disable citizens, communities with limited access to basic services and infrastructures, people with reduced abilities and skills, seniors citizens, etc. (Holmes, 2018).

Supporting bottom-up activities and participation in the design processes. The a priori design for holistic groups of citizens and real communities of people gives the opportunity to co-designing a better and inclusive world, rich of enabling solutions. In the post-pandemic scenarios, the stakeholders' involvement in the design processes – convergence of bottom-up instances with semi-vertical design strategies – will be essential in order to maximise the impact of those solutions really needed by the communities of people, which also will give the opportunity to personalize and regionalize the quality of solutions by developing tailored qualities (Cappo, 2002). An important aspect to be considered in these co-design actions is giving people the chance to be emotionally engaged with what they will use in the future, as well as to create active involvement, sharing of lessons learnt and scalable emulations. Bottom-up activities and participation in the design processes encourages inclusive learning processes at all scales, by increasing the quality of design actions.

Improving human and social wellbeing. As discussed, the new enabling solutions will meet the vision of socially inclusive scenarios of sustainable living; however, this idea should be consistent with the ones discussed by Ezio Manzini (2002) about the human and social wellbeing and the sustainable quality of life. Accordingly, the regeneration of quality of life is supported by the access to context-based solutions, rather than from their ownership. The enabling solutions will operate in a distributed scenario where stakeholders and final end-users, which will cooperate in the design, development and refinement of the best solutions, will be able to increase the capabilities of people in performing daily tasks as well as in producing personal enjoyment and satisfaction by meeting real human skills. This vision is therefore consistent with the idea of social inclusion in the way solutions expand the human desires to obtain rewarding results, than only in the performing tasks. The idea of wellbeing moves from the medical domain to holistic views converging social, economic, relational, sociological and psychophysical conditions (see WHO 2001) where solutions express also a new regenerative social power (Manzini, 2003).

Designing sustainable living conditions. Designing considering the impact on people's lifestyle alludes to understanding the new needs in consuming enabling inclusive solutions within healthy living contexts, which directly and indirectly meet the social, economical and

environmental aspects of sustainability and, consequently, converging into the new scenarios of inclusive communities[2]. Therefore, the design of enabling inclusive solutions must consider the quality of environments where they will be used, as well as their latent power to regenerate the living contexts through their use, for example through the human-product interaction.

Designing using sustainable catalysts. The design of enabling solutions to boost the end-users' social inclusion within sustainable living environments can benefit of the so-called 'sustainable catalysts', which are a set of formal and informal, tangible and intangible, analogical and digital, biological and technological elements reinforcing the social aspects of the interaction between humans and solutions in a socially inclusive and sustainable way. To be more precise, the new enabling solutions could be designed considering the cutting edge sustainable design approaches and technologies (see Ceschin and Gaziulusoy, 2019) that would allow the design of eco-efficient and human-centred solutions. Besides, informal digital networks can support all human activities meeting people's needs, while mitigating environmental impacts (Blevis, 2007). Then the collective intelligence of people and unstructured networks of interests would implement the effects of solutions in enabling contexts while supporting the resilience of living places. Therefore, sustainable catalysts are designable phenomenological elements reinforcing, proactively, the convergence between social inclusion and sustainability.

Designing for Inclusion. As said, enabling solutions must be conceived to include all people in the future post-pandemic scenarios; however, the social inclusion can be obtained both using specific inclusive-oriented methodologies, which help designers in addressing their efforts in the most promising trajectories, and by adopting a new design deontology, which is more ethical, inclusive and sustainable. Designing for inclusion is not only an approach, but also a cultural target on which hinging the development of future enabling solutions. This shift is very important since it re-orientates the entire cultural and philosophical design behaviours toward the domain of social inclusion.

3. ENABLING INCLUSIVE SOLUTIONS

In the inclusive-oriented design scenarios, an enabling inclusive solution is a designed 'artefact', either tangible, or intangible or a mix of them, able to capitalize the inclusive-oriented design practices within sustainable living environments. The term 'inclusive practice' refers to the human dimension of activities that the artefact can perform, as well as the level of involvement generable throughout the life cycles (i.e. stakeholders participation in co-design actions). The term 'enabling' refers to the quality of the interactions generated by the solution in relation to the contexts of use, together with the relations with production systems used for its generation. Inclusive enabling solutions support both social inclusion's aims, being artefacts designed following the human needs of final end-users using participative design processes, and sustainability-related instances. Accordingly, enabling inclusive solutions are artefacts converging Design for Social Inclusion and Design for Sustainability's insights.

In the long run, the impact of enabling inclusive solutions will be visible at the social dimension – i.e. the solutions will create consistent interactions between people and tasks because developed using bottom-up participative design approaches – on the environmental dimension – i.e. the solutions will create strong connections with living and working

environments, at all scales, by mitigating wastes and ecological risks because manufactured using sustainable productions – and at the economic dimension – i.e. the solutions will generate favourable living conditions by meeting human needs and active participation.

4. PROMISING TESTING GROUNDS

Three promising inclusive-oriented design scenarios have been identified to test the insights discussed in the inclusive ideas:

1. Resilient inclusive places (including living spaces, workplaces and public areas).

2. Active networks connecting people, functions and resources.

3. Technology-enabled communities and living places.

These scenarios have been refined and detailed into thirteen promising testing grounds. The goal of this section is to describe a number of design topics that could be developed in post-pandemic scenarios to support the transitions toward future enabling living conditions.

4.1. Resilient inclusive places

Four promising testing grounds compose the scenario for *Resilient inclusive places,* which connects human activities, including physical and cognitive abilities, with sustainable living conditions, environments and enabling technologies.

Enabling living, recreational and working equipment. Studies on how the different approaches on Design for Social Inclusion (i.e. co-design, universal design, etc.) stimulate the design of smart and sharable enabling solutions, helping people to live longer, happier, socially, as well as to work efficiently, even in domestic environments. This testing ground intercepts the inclusive and sustainable characteristics of designable solutions in relation to the policies of sharing and the social perspectives of Design.

Resilient places supporting people's psychophysical and cognitive abilities. Studies on the application of the resilience theory – the regenerative power of a system to adapt itself to new events and social phenomena – in the design of human-scale 'places', and how people's real physical and cognitive factors can be improved by aware design policies. This testing ground interprets the psychological and cognitive qualities of environments to support human activities in relation to the perceived sense of wellbeing.

Enabling environments supporting the coexistence of living and work activities. Studies on how to design proactive places supporting living and working activities. This testing ground examines the combinability of living, work-related and recreational activities, by overcoming the need of specific equipment. Accordingly, it addresses the human-centred issues both for the design of places and the design of furniture.

Inclusive neighbourhoods and business districts. Studies on how to extend the concept of domestic places to larger scales by connecting social aspects, environmental requirements and business factors. This testing ground focuses on the (eco)systemic impacts of social inclusion on large-scale contexts of use. Specific sub-topics could concern: the design of inclusive neighbourhoods; the application of Design for Social Inclusion in cultural, tourism and business districts; the design of inclusive living ecosystems and shared relational places.

4.2. Active networks connecting people, functions and resources

Five promising testing ground compose the scenario for *Active networks connecting people, functions and resources,* which aims to explore the value of small- and large-scale enabling networks and infrastructures in relation to the multidimensional aspects of human life.

Inclusive infrastructures, vehicles and transportation systems. Studies on how to transform transportation services and product-service systems into 'social vectors' that promote social inclusion, improve human diversities, enhance communities' capabilities and coexistence. This testing ground explores the impact of Design for Social Inclusion across transportation networks by considering its systemic effects on people, products, services and product-service systems, as well as on architectures and infrastructures.

Inclusive and sustainable connection systems. Studies on how the Design for Social Inclusion improves the qualities of sustainable systems connecting people, places and resources. This testing ground explores the evolution on transportation systems, considering them as a set of tangible and intangible artefacts connecting people and places. The attention is addressed toward the social relations of travellers, their entertainment and interactions with places, the user experience and the systems' usability.

Needs-oriented living systems and infrastructures. Studies on how to reshape the essential living systems and infrastructures on human needs, and how to design needs-oriented enabling solutions helping people to live better, moving the attention to the design of products to the achievement of results. This testing ground focuses on the communities' needs as a key factor for generating innovative connections systems and infrastructures. The attention also revolves around distributed human-centred living solutions, including mobility places and connection hubs.

Co-design of small- and large-scale smart supply networks. Studies on how people design and collaborate to improve, or make autopietic, supply networks. This testing ground focuses on two important questions: 1. What is the role of people in the design, the implementation and the management of supply networks? 2. How do networked technologies learn and adapt themselves to new collaborative scenarios?

Hybrid platforms for sharing values, time, knowledge and sustainable assets. Studies on how the Design for Social Inclusion support the creation and the implementation of hybrid platforms (i.e. services, interfaces, etc.) for new relational assets, which link communities, resources, smart infrastructures and new business models. This testing ground intercepts the inclusive and sustainable characteristics of designable solutions in relation to the idea of smart platforms, generating sustainable business models for smart cities and communities.

4.3. Technology-enabled living communities

Four promising testing ground compose the scenario for *Technology-enabled living communities.* It focuses on the exploration of enabling technologies as strategic elements for the creation of sustainable and inclusive living conditions for communities.

Enabling technologies empowering the community safety and the neighbourhood care. Studies on the inclusive power of enabling technologies at urban-scale, and their capability to empower the communities by increasing the relational quality of neighbourhoods, the social care, the community health and the financial prosperity. This testing ground focuses on the

inclusive role of technologies in supporting the basic needs of people and on how to boost the relations among citizens using technology-based formal and informal enabling solutions.

Product-service systems and distributed environments for community's health and care. Studies on how product-service systems and distributed inclusive solutions support the perceived (psycho-social factor) and tangible (socio-economic factor) sense of wellbeing within communities. This testing ground focuses on the implications generated by the Design for Social Inclusion on PSSs.

Barrier-free technologies supporting communities' everyday life. Studies on how to reduce the technological barriers that improve the social and business activities. This testing ground focuses on how to design fully accessible technology-based solutions.

Inclusive learning platforms supporting sustainable ways of living. Studies on how sustainable learning platforms and distributed education services support the development of inclusive ways of living, as well as mitigate the redundancy of resources. This testing ground explores the links between Design for Social Inclusion and Design for Sustainability in the creation of collaborative and distributed inclusive platforms supporting sustainable ways of living.

5. CONCLUSIONS

Despite the COVID-19 pandemic has drastically changed the life of people in all countries and produced a systemic discontinuity in the ways people now consume products, networks and cities, there is an optimistic vision for the future of the Design discipline in the post-pandemic phases. From the etymological analysis of the term 'crisis' – in ancient Greek, *'krisis'*: a decisive moment, an opportunity for the change – we can interpret the actual events to rethink the future living scenarios, where new human-centred solutions will generate new sustainable and inclusive levels of wellbeing. In this vision, enabling inclusive solutions will play a fundamental role by stimulating sustainable and inclusive design practices as well as aware business models and ways of consumption. Whilst the post-pandemic scenarios will require a strong design attention, it will be possible to use a number of inclusive ideas to support the transition toward enabling living conditions. Accordingly, the post-pandemic living scenarios will allow experimenting new ideas for inclusive and sustainable wellbeing by using a resilient mix of solutions converging the Design for Social Inclusion insights with contemporary trends of Design for Sustainability.

ENDNOTES

[1] The term 'exclusive', which is antithetic of 'inclusive', describes any phenomenon feeding the sense of social exclusion and, by extension, any solution usable only by 'the few'. Therefore, an exclusive solution is an artefact usable only by few customers, conceived using non-holistic design references and, in the worst condition, a solution characterized for being a 'disabling artefact'.

[2] Conceptually, this vision is similar to the one discussed in Manzini and Jégou (2003) about sustainable living communities.

REFERENCES

Blevis, E. (2007). Sustainable Interaction Design: Invention & Disposal, Renewal & Reuse. In *Proceedings of CHI 2007*. San Jose, CA, April 28–May 3, 2007. (pp. 503-512).

Cappo, D. (2002). Social inclusion, participation and empowerment. In *Australian Council of Social Services National Congress*. Hobart, 28-29 November, 2002.

Ceschin, F., Gaziulusoy, I. (2019). *Design for Sustainability: A Multi-level Framework from Products to Socio-technical Systems*. London: Routledge.

Design for Emergency (2020). Analysis. Retrieved July 7, 2020, from https://www.designforemergency.com/analysis-eng

Donahue, S., Gheerawo, R. (2009). Inclusive Design 2.0: Evolving the Approach and Meeting New Challenges. In *Proceedings of Include 2009: Inclusive Design into Innovation Conference*. London, 5-8 April 2009.

European Institute for Design and Disability (2004) *The EIDD Stockholm Declaration*. Stockholm: EIDD.

Goehrke, S. (2020). *3D Printing Against Coronavirus: Who and How to Help*. Retrieved July 1, 2020, from https://www.fabbaloo.com/blog/2020/3/18/3d-printing-against-coronavirus-who-and-how-to-help

Guterres, A. (2020). *COVID-19 in an Urban World* (July 2020). Retrieved July 29, 2020, from https://www.un.org/sites/un2.un.org/files/sg_policy_brief_covid_urban_world_july_2020.pdf

Hale, T., Angrist, N., Kira, B., Petherick, A., Phillips, T., Webster, S. (2020). Variation in Government Responses to COVID-19 (Version 6.0). *Blavatnik School of Government Working Paper*, May 25, 2020. Retrieved July 7, 2020, from http://www.bsg.ox.ac.uk/covidtracker

Holmes, K. (2018). *Mismatch: How Inclusion Shapes Design*. Cambridge, MA: The MIT Press.

John Hopkins University, Coronavirus Resource Center (2020). COVID-19 Dashboard by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU). Retrieved December 15, 2020, from https://coronavirus.jhu.edu/map.html

Jordan, P. (2000). *Designing Pleasurable Products: An Introduction to the New Human Factors*. London: Taylor & Francis.

Manzini, E. (2002). Context-Based Wellbeing and the Concept of Regenerative Solution: A Conceptual Framework for Scenario Building and Sustainable Solutions Development. *The Journal of Sustainable Product Design*, 2: 141-148. DOI: 10.1023/B:JSPD.0000031026.11908.1d

Manzini, E. (2003). Scenarios of Sustainable Wellbeing, *Design Philosophy Papers*, 1(1): 5-21. DOI: 10.2752/144871303X13965299301434

Manzini, E., Jégou, F. (2003). *Sustainable Everyday: Scenarios of Urban Life*. Milan: Edizioni Ambiente.

Manzini, E., Jégou, F., Meroni, A. (2009). Design Oriented Scenarios: Generating New Shared Visions of Sustainable Product Service Systems. In M.R.M. Crul, J. C. Diehl, C. Ryan (Eds.) *Design for Sustainability. A Step-by-Step Approach* (pp. 15-32). Delft University Technology: United Nations Environment Programme.

Manzini, E. (2015). *Design, When Everybody Designs: An Introduction to Design for Social Innovation*. Cambridge, MA: MIT Press.

Silver, H. (2019). Social Exclusion. In A.M. Orum (Ed.) *The Wiley Blackwell Encyclopedia of Urban and Regional Studies* (pp. 1-6). New York, NY: John Wiley & Sons.

Stolton, S. (2020). *EU Industry Touts 3D Printing as 'Immediate Solution' to COVID-19 Shortages*. Retrieved July 1, 2020, from https://www.euractiv.com/section/digital/news/eu-industry-touts-3d-printing-as-immediate-solution-to-covid-19-shortages/

World Health Organization (2001). *The International Classification of Functioning, Disability and Health* (ICF). Geneva: WHO. Retrieved July 1, 2020, from https://www.who.int/standards/classifications/international-classification-of-functioning-disability-and-health