

Building community wellbeing ecosystems together: optimising the social design of fitness equipment

Mengcao

University of leeds Leeds, England University of leeds LS2 9JT;

Abstract: This paper focuses on the social design of fitness equipment within the context of building community wellbeing ecosystems. It argues that the design of fitness equipment should not merely consider physical exercise functions but also play a positive role in promoting social interactions and enhancing the overall well - being of the community. Through user research, case analysis and other methods, it is found that the current community fitness equipment has some problems, such as poor human - machine interaction experience, insufficient social interactivity and lack of attractiveness. To address these issues, this paper proposes a series of optimization strategies, including gamification design, modular design and the application of Internet of Things technology. For example, by adding social elements such as online competitions, point - scoring systems and medal collections, users' enthusiasm and initiative for fitness can be effectively improved. At the same time, through the optimization of the structure and management mode of fitness equipment, two - way information communication among users, managers and maintenance personnel is realized, so as to reconstruct user relationships and promote the construction and development of community wellbeing ecosystems.

Keywords: Sustainable design, collaborative design, social design, fitness equipment design

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1 Introduction

1.1 Social and Health Development

Accompanying the acceleration of urbanisation and the improvement of living standards, the lifestyles of the population have also undergone remarkable changes. However, this is an era when the internet covers half of people's days. Although the employment mode has gradually tended to be liberalised, the work related to the Internet also determines that the timeline of work and movement cannot be intersected. As a result, people's space to move around is limited, and opportunities for outdoor activities are relatively reduced. As a result, health has become a common topic. Many urban residents suffer from a variety of physical and mental health problems due to a lack of relative exercise. For example, obesity, cardiovascular diseases, and depression caused by lack of exercise have become major health threats worldwide. According to research studies, chronic physical inactivity is one of the major risk factors for global mortality. According to Figure 1, physical inactivity or sedentary behaviour is associated with an increased risk of common metabolic diseases: the lower the physical activity, the lower the body's metabolic function. However, in the case of strenuous physical strength may be less appropriate, and only the promotion of light physical activity is a complementary way to improve health.

1.2 Importance of community fitness equipment

Community fitness equipment, as a public facility serving the public, can not only provide residents with a convenient place to exercise and help them maintain regular exercise habits; it can also promote emotional interaction between neighbours and enhance community cohesion. According to the survey, there is a considerable lack of community outdoor fitness facilities in China, and the reasonableness of their design and layout will directly affect the residents' sense of experience. However, based on this background, the community public fitness equipment and due to the lack of daily maintenance and become old and safety hazards, resulting in a greater scarcity of intact and undamaged equipment. Therefore, according to the survey, the construction of community fitness equipment will, to a certain extent,

promote the health and well-being of residents. However, in fact, the current fitness equipment still has many problems of use. Its disadvantages and advantages are shown below:

1.3 The rise of the idea of social design

Social design is the practice of combining a vast chain of knowledge to solve existing social problems through design thinking and methods to enhance social well-being.

According to the definition of social design, there are many international insights into the definition of social innovation, the most influential being Victor Margolin, Ivar Holm, Maryland Institute College of Art (MICA), DESIS (Design for Social Innovation and Sustainability), Ezio Manzini, IDEO and Yusuke Kakei. They emphasised that social design exists to solve social problems by addressing the general public and to meet the needs of society.

2 Purpose of the Study and Significance of the Study

2.1 Research Purpose

The purpose of this study is to present an innovative model in the field of social design by taking the issue of community fitness equipment as an entry point, and to illustrate that the traditional design model is no longer able to respond to the current needs of society, and that new design concepts need to be explored to bridge the difficulties encountered by society. Through the case studies and field research, a set of fitness equipment design and layout solutions for the community is concluded to promote the well-being of the community residents.

1. To draw out the importance of social design by analysing the social problem hotspots of the current status of community fitness equipment.

Through the preliminary literature, we learnt about the number, type, distribution, frequency of use and maintenance of community fitness equipment, and found out the problems and shortcomings. However, the importance of social design lies in the fact that it not only focuses on the functionality and aesthetics of products and services, but also on solving social problems, enhancing social well-being, and promoting social equity and inclusion as a means to promote sustainable development and social innovation. That said, there are many challenges and constraints to its implementation. For example, by strengthening multi-party coordination, increasing user participation and seeking policy support. Therefore, with scientific planning and management, these problems should be solved.

2. By exploring the impacts that social design has brought to society from the past to the present, and analysing the value that exists in social design.

In the early days, social design mainly focused on community building and improvement of public facilities, and the goal of design began to change to optimising the public service system. Its purpose was to improve the quality of life of residents. With the complexity of social problems, the scope of social design gradually expanded, and designers began to participate in public welfare projects. By designing to improve the living conditions of disadvantaged groups, new technologies and approaches are utilised to come up with more innovative system solutions. Examples include healthcare, education and transport. On the contrary, in the process of implementation, there may be cultural conflicts, uneven distribution of resources and financial burdens. Therefore, the Institute can maximise the positive effects of social design while minimising its negative impacts.

3. Comparing the current status of social design at home and abroad to obtain the current design trends, and what are the necessary conditions for thinking about the redesign of fitness equipment in this way.

Comparing the current situation of social design at home and abroad, the sustainable design of community building is an important direction of current social design. Through in-depth analyses of the literature, the design of fitness equipment needs to take into account user needs and participation, safety and ease of use, sustainable design and green development, and the necessary conditions of community building. In this way, high-quality fitness equipment that meets the needs of modern society can enhance the health and quality of life of community residents.

4. Case studies and participatory design are used to synthesise and extract the characteristics of the form and function of the fitness equipment as well as the sketching of the user's 'ideal product'.

Successful social design cases were analysed to understand their salient functional features. For example, the redesign of bicycle sharing and the reuse of recycled delivery boxes. These are green designs that recycle and reuse materials, respectively. In addition, the interactive activities with the target users during the engagement process are combined to gain an in-depth understanding of the users' pain points and expectations, so as to further collect the test feedback provided by the users. Ensure that the design solution is in line with modern trends and meets the actual needs of users.

5. Through the basic literature review and methodological exploration in the early stages, a realistic expectation of the future trends of this product research is made.

Future trends in fitness equipment design can be clearly seen through the existing literature. These trends are not only in line with the current direction of technology and social development, but also reflect the actual needs of users for fitness equipment. From this, multifunctional modular design based on user experience, health data management, green sustainable design and other multi-functional modular design can be used to add environmentally friendly, efficient and personalised fitness experience to the future fitness equipment, and also to provide valuable reference for enterprises or R&D organisations.

2.2 The significance of social design to contemporary society

2.2.1 The connection between social design and society

The relationship between social design and society is multi-layered and multi-dimensional. The ways in which design exists are collectively referred to as social design, a practice of solving social problems, improving the social environment, and enhancing social well-being through the means of design. This field emphasises that design is not only about serving business and aesthetics, but also about meeting the needs of society and promoting social progress. However, with social design encompassing such a complex web of relationships, its internal problem solving is also mixed with various design directions. For example, inclusive design, user-centred design and sustainable design. This is not only in line with ideological factors, but also requires people to face various social issues to meet their real challenges. There is even a need to enhance social resilience by solving social problems, promoting social equity, enhancing community cohesion, and fostering culture and innovation through design. Designers, as agents of social change, build better and harmonious sustainable societies through innovative and inclusive design concepts. As a result, researchers have come to realise that although the relationship between the two is cumbersome, without the safe haven of both parties, it is similar to 'running naked'.

2.2.2 Impact of social design on society

According to research, social innovation is categorised into three main features: human needs fulfilment, relationships between people and society, and communities giving people appropriate training. Numerous studies have shown that the creative design of society is going through a multifaceted network of resources to achieve a great social integration and to iterate the model of sustainable consumption. Therefore, in order to avoid the disconnection between future design and the real society, combining the previous literature, through the new trend of human-centred social design, the establishment of a four-way community of communities, designers, enterprises and residents, to obtain a broader perspective, in order to make the design better to serve the human beings for the actual needs.

On the contrary, if design lacks iterative thinking, it will inevitably fall victim to society, and then the designed products will be meaningless. For example, dating back to the 1920s, the discontinuation of the Ford Model T has shown that a product's monolithic nature cannot resist the product life cycle cycle. Since then, although there have been improved designs for it, they have been changed and updated to meet the transient needs of the public, thus ignoring the safety of the product for people as well as the environment. For example, the ultimate streamlined car: the Rumpier Tropfenwagen, with a body shaped like a teardrop. As a result, these products are also the cause of the inability to continue to this day.

In contrast, IKEA's design originated in 1940 and is still a very successful corporate brand. This is also based on the fact that its products fulfil the conditions of sustainability, green and social design. For example, it is centred on designing products that are shaped to fit into flat packs, which saves a lot of space and is easy to transport. Therefore, these represent the significance of social design.

3 Research content and methodology

The purpose of this study is to illustrate the development trend and importance of social design by using the old fitness equipment in the community as an entry point. First of all, the researcher will use the case study method to investigate, probe and analyse the specific phenomenon of social design in depth. The researcher will extract and summarise the key information points from the case study, and combine it with the previous literature review to understand the actual situation of the users behind the project, the usage environment and the needs. Summarise the shortcomings of the existing research and provide the necessary specifics for the later research activities. Secondly, based on the large amount of literature provided in the preliminary stage, a participatory design approach is used to obtain their needs and feedback, from which relevant data on functionality and form, as well as sketches, are obtained. These needs were further verified and refined through direct interaction, thus providing further theoretical information on the actual development and design of the fitness equipment.

3.1 Case Studies

3.1.1 Basic Concepts of Case Studies

Case study refers to the in-depth study of a particular person or event. And in the process of studying a case, it is used to look for patterns of behaviour and causes to get the required information from it. However, the advantage of a case study is that it can be used to capture strategic information about what, how, and why from an existing example. Giving the researcher the opportunity to gather hypotheses analysed in experimental studies. The disadvantage is that the audience is not broad and may be less scientific and rigorous. Therefore, this method is useful when researchers want to gain insights into a particular phenomenon or explore new areas of research.

3.1.2 Overview of relevant cases

In this study, we take the community fitness equipment reset as the starting point, and remove the dregs and take the essence of the current social design cases, so as to provide a solid foundation for the later research.

From the perspective of green design, as the express cartons need to consume a large number of trees, destroying the ecosystem, and with the rapid development of the express industry, the carbon dioxide emitted during the production of cartons will increase the emission of greenhouse gases and lead to a decline in air quality. On the contrary, a large number of cartons are discarded after use, taking up land resources and making it difficult to degrade. If the cartons are incinerated, the harmful gases and particles released will further pollute the air. Therefore, the emergence of recycled courier boxes is a green symbol of sustainable, recyclable use. As shown in Figure 9, its top and bottom are cleverly designed with adhesive strips and easy-to-tear seals. It is easy to open and flatten for storage, realising an environmentally friendly and sustainable packaging design. Although it has not been officially launched yet, it is gradually becoming known.

On the other hand, according to news reports, the negative impacts of bike sharing have been seen repeatedly since the beginning of 2019. Although the bicycle has brought a lot of convenience to the public, it has also led to a lot of broken cars because it does not do timely maintenance, and the waste cars not only encroach on urban roads and affect the urban environment, but also bring safety hazards to the riders. In this case, YUUE Design Studio has designed a design for recycling damaged and old vehicles and reusing them. As shown in Figure 10, the parts of the shared bicycle were disassembled and reorganised. For example, different styles of chairs. Even the design travelled thousands of miles with its owner to cities such as Shanghai, Berlin and Milan to participate in exhibitions. Each product has its own story and its own beauty. However, to be sure, it means that with easy methods and rough tools, it is also possible to change discarded materials into something beautiful. Therefore, bike sharing reuse is a way to maximise the life cycle of the bike and reduce the waste of resources through the scrapped parts of the Mobike by recycling and reusing them into chairs twice.

As can be seen, evaluating these two case studies provides an in-depth exploration of how past social design concepts can be incorporated to address the themes of this research, and through a comprehensive and effective understanding of the design process and modus operandi involved. This will enable the researcher to better understand user needs, assess social impacts, and promote design innovation, which, combined with the literature on interdisciplinary collaboration, will provide important guidance and insights into contemporary social design.



图 9: BOX+设计效果图



图 10: 共享单车再利用设计的产品

3.2 Participatory Design

3.2.1 Basic concepts of participatory design

Participatory design is a design methodology that seeks to engage the public in the design process to help ensure that the results meet the preferences of the target audience. The advantage is that during the design process, participants can use a variety of tools to portray what they believe to be the “perfect product”, allowing the researcher to learn more about the needs of the target audience. However, due to the lack of relevant expertise of the participants, users of participatory design are not in a position to influence the final development decisions.

3.2.2 Overview of the participatory design process

During the participatory design process of the study, the researcher simultaneously assumes the role of a designer, working with the community to create prototype concepts of ideal fitness equipment on behalf of the users. Creative collaboration was established and sketched with facilitators by providing tools for ideation and expression. Firstly, in terms of the functionality of the fitness equipment, a user study of the participants can be conducted to build their user journey maps to understand their personal information as well as all the key touchpoints in their current state, in order to understand the customer's goals, feelings, and pain points at each step of the process. Secondly, in terms of the shape of the fitness equipment, a workshop needs to be organised with basic materials such as pens, paper and whiteboards prepared in advance. Together with the participants, they draw and negotiate their ideal shape of the gym and the functions it performs. Therefore, the participatory design workshop needs to end with a review of the expectations and objectives of the study to ensure that they were met.

4 Expected results

4.1 Contribution of this research to society

This study aims to design enhancement of aging community fitness equipment to contribute to the current trend of social design. Through the previously mentioned case studies of the Sun Community and the reuse of shared bicycles, new social design perspectives can be gained from them to view the ideas and processes of their research. Then extract the

required information to combine and adjust the design approach of this research, and analyse in depth what kind of design method is in line with the current design megatrend.

4.2 Limitations in the research process

Based on the process explored in the preliminary stage, there are certain limitations at each stage. From the scope of the preliminary research, no fixed target range of people is determined, so the design process needs to take into account the usage rate of a variety of target groups. It is relatively difficult to design. From the viewpoint of the research method, especially in the specific function and shape extraction of participatory design, since the synergistic personnel are from a combination of professional and unprofessional, so its final results need to be analysed and summarised specifically by professional personnel.

4.3 Future vision

In the future research landing, it may need to do the synthesis of research and practice, from the research aspect, it needs to do the specific analysis of the methodology and literature review; to do the refinement of the key elements and information. From the aspect of landing products, it is necessary to synchronise research and practice, and how to achieve a perfect fit in terms of form and function is the most important thing.

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- Author Bio: Mengcao, May 1990, Nationality: Han. Native place: Xinjiang, China, Backgroundgrad: Postgraduate Research interests: Design, visual communication design, computer graphics design, interaction design.