

# ARCC 2023 CONFERENCE PROCEEDINGS

## THE RESEARCH - DESIGN INTERFACE

EDITORS: Saif Haq and Adil Sharaf-Eldin

EDITORIAL ASSISTANT: Sepideh Niknia

Hosted By Texas Tech University

HUCKABEE  
COLLEGE OF ARCHITECTURE

ARCC

# Developing a Visual Tool to Encourage Public Participation in Decision-Making Processes for Intervening in an Urban Historical Context

Najmeh Malekpour Bahabadi<sup>1</sup>, Mahyar Hadighi<sup>2</sup>

<sup>1</sup> Texas Tech University, Lubbock, TX

<sup>2</sup> Texas Tech University, El Paso, TX

**ABSTRACT:** Citizens can be meaningfully involved in multiple phases of the urban planning process from decision-making to implementation via a dedicated online platform through which they can interact with planners and decision-makers. In historical contexts, local people are essential resources for decision-makers seeking critical local information needed for effective planning and intervention—including what those citizens recall from the past about the area's social values and the built environment and what they imagine and hope for their neighborhood's future. This public knowledge, collected through storytelling and mapping, can play a fundamental role in shaping the framework for neighborhood rehabilitation plans. As a foundation for designing an online visual questionnaire to collect local knowledge and understand the views and expectations of local people, this study focuses on theoretical ideas to define a framework for an online visual questionnaire tool. The tool presented provides a common visual language that people can easily understand and use whatever their social class, education, or background. It also has the benefit of enabling citizens and planners to interact directly regardless of their geographical location.

To proposing a framework for the online visual questionnaire, the first step was to review some existing visual tools and methods, including analog used for community engagement and digital used in urban planning to encourage and support public participation. Through an analysis of these methods, some important variables and criteria were identified that further our understanding of citizens' perceptions of their neighborhoods. The next step, as part of a larger study, will be examining a historical public space, including a bazaar, hammam, and cistern—located in the historical context of Yazd—a central city in Iran registered as a cultural heritage site by UNESCO—as a case study with the larger goal of identifying some specific criteria, based on the culture and the vernacular architecture patterns, to inform the questionnaire's framework.

**KEYWORDS:** Visual questionnaire, Public participation, Local knowledge, Urban historical context.

## INTRODUCTION

In his book, *The Deliberative Practitioner*, John Forester states that city planners can shape public learning and public action by consulting with city residents. Planners can also play an important role in promoting citizens' hopes or deepening their resignation in regard to the future and functionality of the area where they live by "sharing or withholding information, encouraging or discouraging public participation" (Forester 1999, 4). According to Barbham (2009), "interdisciplinary and participatory design collaborations" in the design disciplines including urban planning constitute the best and most democratic way of solving the societal problems of the digital, postindustrial age. In addition to seeing public participation in urban planning as a democratic process, he argues that citizens' involvement in the planning and design process will render the plan more acceptable to its future users of the place by taking their knowledge, perspectives, and insights into account. In a study focused on defining a typology for geoparticipation, Zhang makes a similar argument: "Ideally, a participation project seeks to achieve a high level of citizen engagement where citizens may have the power to influence the processes and outcomes of decision-making" (2019, 40). Further, Nelessen challenges standard planning practices as follows: "The non-traditional planning and design process will not bear fruit if we cannot bring people—municipal officials and developers, engineers and planners, the community at large and the body politic—together to effect real choice" (Nelessen 1994, 81). Nelessen also notes that participation not only makes the planning process more fluent but also reassures the community that its preferences will be considered. In terms of an urban historical context with local communities, employing social science is perhaps even more critical than in other environments, especially when the planners are not local. In these contexts, due to their sense of belonging, particularly if they have lived in the area a long time, people are more likely to participate in the planning process in order to share their stories about the past and their ideas for the future. The information they share about the social, cultural, and symbolic meanings of the built environment can inform planners' decisions on the direction of the neighborhood's future. Yet, although involving citizens in decision-making processes is vital, they are not urban planning professionals or experts; therefore, as Al-Kodmany (2000) has argued, their engagement will be meaningless if they cannot understand the plans or express their ideas. For this reason, finding common ground between local people and planners or designers is necessary to bridge this knowledge gap. To achieve this goal, it is incumbent on planners and designers to determine—based on their evaluation of the culture and the context—the most effective ways to interact with local

people and the best ways to exchange ideas. Also, “in order for decisions to be made in a democratic fashion, structural mechanisms and tools must be developed through which personal wishes can be brought to the surface to reach a consensus” (Al-Kodmany 2000, 220). Among the communication tools to consider for this purpose is visualization. Al-Kodmany argues that “visualization, which can take many forms, is highly effective for drawing out the public’s concerns and opinions” (Al-Kodmany 2000, 220).

To help people share their knowledge, information, and perceptions of the built environment, this paper investigates how to define a framework as a basis for designing an online visual questionnaire. While we confirm that “effective visualization is the key for communicating ideas and engaging public participation, the question then centers on identifying the most effective techniques in a given planning situation. “The answer will depend on the skills and experience of the participants, the size of the geographic area being analyzed, the resources of the leadership team, and the stage a group are at in the planning process” (Al-Kodmany 2000, 222). To answer this question, the design process comprises two main steps: First, a fundamental framework is put in place to facilitate data collection. Second, the questionnaire content is determined and a way to visualize the historical context’s qualities and prioritize the information needed for future planning are set as a basis for deciding on some criteria for the questionnaire’s content. In reference to the first step, in this paper, visualization methods and tools that are well-established in community development and urban planning are considered. In reference to the second step, a historical public space in the historical context of Yazd, Iran, is investigated. Next, a discussion is presented focused on connecting the results of the two steps to facilitate the design process of online visual tools in the future.

## 1.0 VISUAL TOOLS AND PEOPLE’S PERCEPTIONS

The built environment as the context of everyday life conveys meaning far beyond what we can see. It has significance that both stems from and supports social life and culture. By studying the built environment, designers and researchers can identify signs of cultural and social life and hidden meanings by working with residents who have lived in and, therefore, are familiar with the current physical environment. Planners and residents need to find a common language—one that is not necessarily verbal—so that they can understand. According to Sannof (1991):

“Perceiving and interpreting the physical environment is a complex process involving the interaction of human physiology, development, experience, and cultural sets and values with outside stimuli. In making sense of the visual world, we rely on a number of physical characteristics which define objects and their relationships in three-dimensional space. (Sannof 1991, 14).

Pointing to the “difficulty with materializing the abstracted reality of planning proposals” and the challenge of communicating changes that are introduced as planning proceeds, Wilson proposed “visualizing these developments through augmented reality to demonstrate the visual impact of proposals, turning abstracted technical drawings into photo-realistic images that are more easily understood by people” (Wilson 2019, 184). Echoing the importance of visual data, Jang and Kim commented that check-in locations and photographic images constitute “the two most commonly used types of data in measuring and quantifying people’s spatial perceptions” (Jang 2019, 3). Further, researchers have shown that visual tools enable broader participation in the planning process, opening it up to, for example, “people with physical or cognitive disabilities” (Glegg, 2019, 302), and that such tools can help “address language barriers across cultures and literacy levels” (Oliveira & Partidário, 2020). “Visualization, on the other hand, is any technique for creating images to communicate a message. The use of immersive visualization and more natural interaction increases the sense of presence, creating an enhanced game experience” (Varinlioğlu, et al. 2022). Rene Davis, Professor of Architecture and Urban Design at University of California, Berkeley, talks about the storyboard as a preliminary design tool in film making, and investigates its possible role in architectural education. He also discusses “the dominance of visual culture in progress since the advent of television” (Davids 1999, 239). Corrie van der Lelie, faculty of Industrial engineering at Delft University, also discusses storyboard and its role in the product design, and the way “this visual script integrates all parties involved in the production” (Lelie 2006, 159).

In order to involve people in a given community in the decision-making process and to help them interpret their physical environment and share their knowledge, planners employ diverse visualization and mapping methods, as it will be discussed in the following sections. Some of the tools and methods such as photo interviewing and the Ten Seed Technique are analog and appropriate for working with local communities, whereas others are primarily place-based and facilitate the process of gathering critical information directly from the environment. “Digital mapping applications are often used in consultative geo participation projects to collect local spatial knowledge regarding public perceptions of local environments; and participants are actively involved with commenting [on] and discussing place-based issues regarding specific planning and development projects” (Zhang 2019, 40). Some research draws on a mix of analog and digital tools, such as the case of Pilsen in Chicago by Al-Kodmany (2000). Through a review of these methods and tools, a holistic overview is presented in the next section as a context for designing a framework for a visual questionnaire.

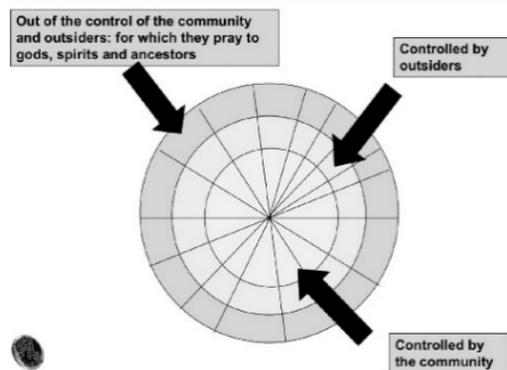
## 2.0 EXISTING VISUALIZATION METHODS

This section focuses on a review of the existing visual tools and methods developed and tested in different contexts, including the US, the UK, and China. The reviewed tools are divided into three categories: (1) analog tools and methods used by municipalities to determine principles and regulations or to develop guidelines for community development, (2) computerized visualization methods that are common in urban planning, and (3) tools that combine high- and low-tech methods.

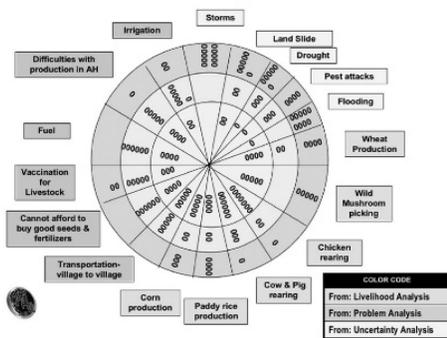
### 2.1. Analog tools and methods

In *Visual Research Methods in Design*, Sanoff (1991) proposes two visual methods: photo interviewing and “knowledge of emerging environmental preservation strategies (KEEPS). The first method “Photo interviewing” is used to explore residents’ perceptions of their community in the residential community of Twin Rivers, New York. The research conducted by asking two sets of questions related to location and meaning in relation to photographs of the area and the residents’ evaluative comments on the photographs. The second method “knowledge of emerging environmental preservation strategies” (KEEPS), used in the town of Murfreesboro, North Carolina, focuses on “Identifying environmental qualities, formulating community goals, and matching the appropriate strategies to the goals” (Sanoff 1991, 165), as the three important phases of the process. In the first phase, three drawings depicting the past, present, and a suggested future of the neighborhood without the action of the residents are shown to the residents. The residents then share their notes on the qualities of the neighborhood depictions and their opinions of each. The residents then state and prioritize their goals for the neighborhood and the strategies and methods for implementing each of these. Anton Nelessen (1994), in *Visions for a New American Dream*, discusses visualization techniques to promote democratic design and planning, including visual preference survey (VPS). The purpose of VPS, which includes photographs, evaluation forms, and a questionnaire (optional) as a basis for analysis, is to help residents express their views on the present community image and come to an agreement about its future character. In vision Planning Survey, the visual and spatial qualities as well as the functional characteristics of the neighborhood in its current state are presented as images to residents who are asked to rate them as acceptable or unacceptable on a scale of -10 to +10. “The images must reflect what people see when they move through the study area, along streets, sidewalks, and public spaces, all of the integral components of the public viewshed” (Nelessen 1994, 84). Through an analysis of the VPS, some design features are extracted to include in the master plan. These features, which could pertain to specifications for walls and materials, net density, setbacks, decorative elements, roof pitches, etc., can serve as a guide for architects in designing buildings that reflect the character of the vision.

The Ten Seed Technique is a qualitative tool developed by Jayakaran (2002) to investigate how members of a community view various issues. The technique “can be used to explore perceptions on many topics, ranging from equity in distribution and access to motivation for taking certain actions” (*The Ten Seed Technique: Learning How The Community Sees Itself* 2002, 14). The technique has the benefit of being very flexible such that it can be used in combination with other techniques. Jayakaran used the technique as a Participatory Learning and Action exercise to understand the relative importance a community places on a given factor in relation to others to through gathering qualitative information on issues “especially related to the perceptions of the community and the way people see themselves in relation to others” (2002, 6) such as wholistic worldview analysis, which as Jayakaran argues further is a productive way of “understanding how the community sees itself and the rest of the world” (2007, 42). As shown in Figure 1, the process relies on broad participation: the innermost circle represents areas where the community is influential, the middle circle areas where outsiders associated with the community can be influential, and the outermost circle areas that are outside the control of these groups. The circles are further divided into segments (Figure 2), each representing a particular issue, which is where the Ten Seed Technique operates. According to Jayakaran, the technique “involves asking the participants to distribute ten seeds into each segment allotted to an issue, to show which aspects were within the control of the community, dependent on outsiders, or totally out of everyone’s control” (2007, 43).



**Figure 1.** Wholistic Worldview Analysis (WWVA) diagram. (Jayakaran, 2007)



**Figure 2.** WWVA + Ten seed technique- People's evaluation of their influence on the community's issues. (Jayakaran: 2007)

**2.2. Computerized methods**

Arno van der Hoeven in his article argues that “social media can function as platforms where the values attached to historic urban landscapes are represented through the narrative practices of storytelling and mapping” (Hoeven 2019, 61). By confirming that text data gathered from social media effectively demonstrate people’s behaviors and perceptions related to a place, in their research Jang & Kim (2019), proposed a novel method to create a visual representation of urban identity—a “crowd-sourced cognitive map”. They employed the method to improve the conventional cognitive mapping method to depict the collective identity of a city and drew a cognitive map through a computational method based on crowd-sourced opinions collected from social media. Location, activity, and meaning are three important factors used by them. “The cognitive map does not necessarily display all locations of the site; rather, selective locations of focus are displayed with descriptive explanations” (Jang and Kim 2019, 8). ChangeExplore is a smart watch app with opportunities for citizen participation in the local planning process; Developed in Newcastle by Wilson (2019), this in-situ app sends notifications and provides information to participants as they move through the place and collects data by asking them about their experiences. Nineteen citizens and three professional planners were asked to pilot the app and provide feedback on their experiences. Wilson found that the app enhanced critical thinking about the built environment and notifications sent from the app increased the participants’ engagement with the place, encouraged them to think about the changes they would like to see there, and gave rise to a sense of power in relation to understanding the place. Based on these findings, the app strengthened the participants’ sense of belonging to the place. The participants’ responses to the notifications allowed the app to find the issues on time. However, Wilson also found that the app elicited issue reporting rather than encouraging citizen participation in creating the future of their built environment.

In a paper presentation, co-authored with Robert Olszewski and Agnieszka Turek (Warsaw University of Technology, Poland), Bogna Kietlińska presented the results of a geo-questionnaire—a tool designed to support social participation—with a sample of 154 respondents answering questions about public perceptions of a recently revitalized street in the city of Płock. The questionnaire provided an opportunity for respondents to geolocate their answers, thereby rendering them less abstract and more suitable for direct use in spatial planning (open geoinformation society). Through the geo-questionnaire, people were able to mark things they liked and things they disliked and respond to open questions. The geo-questionnaire, however, does have limitations, among which are the possibility of confronting inadequate internet access and limited digital skills on the part of users, both of which undermine the tool’s ability to be representative of local citizens (Haklay, Jankowski and Zwoliński 2018, 138).

**2.3. Combination of High and Low- tech methods**

In their work in Pilsen neighborhood, a Mexican- American community with a long history, Al- Kodmani (2000) and his research team from University of Illinois in Chicago studied the new visualization technology to find out how to clarify the planning process for residents. The team aimed to help residents to express their knowledge and science of the community in a productive and meaningful way, understandable for both planners and residents to promote a successful democratic design and planning process. The researchers, therefore, employed GIS to collect critical information in the form of maps and images, and a designer to provide the residents with sketches of their ideas. Overall, communicating in this interactive way resulted in a fluid, contextual design process that promoted community involvement. To collect the data, the research team conducted a workshop in the Pilsen neighborhood, including by inviting local residents to voice their concerns and share their ideas about the future of the neighborhood. The team then incorporated the ideas into GIS plans and the designer drew sketches based on the residents’ ideas and asked the residents their opinions of specific changes proposed. The team indicated that a combination of visualization techniques, both traditional and computerized, proved to be effective in eliciting public participation: “The visual images and maps from the GIS and the responsive sketching by the artist provided a common language to which all members of the community—young and old, poor and rich, powerless and powerful—could relate” (Al- Kodmani 2000, 227).

The JigsAudio developed by Wilson (2019) is an ex-situ physical technology device designed to encourage people to express themselves through drawing and talking. The device is a hardware tool used to collect data from participants including their drawings and recorded voices, which are then presented together on a website. In Wilson’s study, 223

people used the device, and the deployments occurred in partnership with selected hosts in order to test the devices. Systematic observations and informal discussions with participants were used rather than interviews, which were deemed time-consuming and hindered people's participation. Because of the informal nature of the participation and communication method through drawing and recording the ideas, it was difficult to conduct formal interviews with the participants. For this reason, the researchers interviewed the person who collected the JigsAudio data. The app was used for five projects over a period of eleven months, which revealed that the mixture of drawing and talking was effective in engaging participants in expressing and understanding complicated visions that would have been difficult if not impossible to achieve using just one medium. The mix of tools also had the benefit of affording participants opportunities to be more creative and expressive in discussing their views and feelings. The device had a low-tech appearance, which led the participants to feel comfortable using it, which is an important consideration given that it is not uncommon for people to experience stress when asked to work with digital technologies. Pánek demonstrated a mapping web-application system developed in Olomouc in the Czech Republic that "allows a subjective layer of emotional mapping of the city on top of thematic mapping" (Haklay, Jankowski and Zwoliński 2018, 137). The system draws on the concept of emotional understanding of space and place and includes maps to collect emotional data and also a way to capture emotions about using maps. Pointing to the importance of learning from failure, Pánek argued that using an analog approach employing pen and paper can be helpful for people to express themselves but does not work for mapping. However, digital methods through which people can draw points, lines, or polygons are not entirely helpful. Therefore, Haklay et al. combined paper and digital maps as a way to "record details about who collected the information and also to record participant demographic data" (Haklay, Jankowski and Zwoliński 2018, 137).

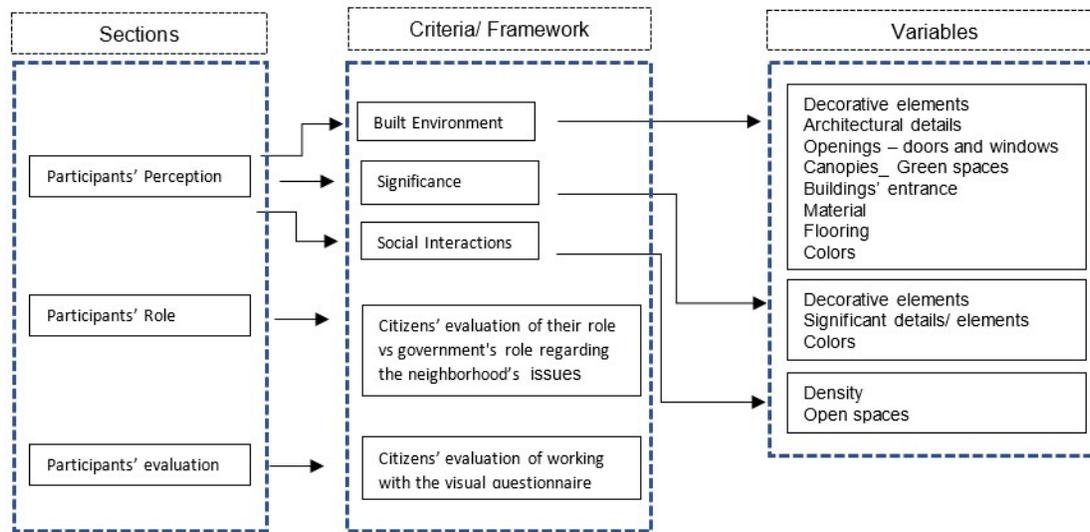
### 3.0 DISCUSSION

Although in gathering local information the importance of in-person discussions and arguments in the form of a workshop or traditional hall gatherings cannot be denied, scholars have argued that though still helpful are no longer helpful these methods should be supplemented or in some cases even replaced with online methods. According to Bobbio (2019), online participation is more effective than townhall-type gatherings for collecting information from citizens, including suggestions, proposals, and ideas. Bobbio referred to the use of the online platform Decidim (Let's decide) on the part of the municipal administration in Barcelona as an example: in 2016, the administration received approximately 10,000 proposals in a period of just a few months. In Brabham's (2009) view, efforts to elicit citizens' participation using web-based strategies benefit from the speed, reach, asynchrony, anonymity, and interactivity of the web as well as its ability to present multiple kinds of content. Furthermore, he emphasizes the web's global reach, which can be used to enable people regardless of location to communicate. According to Wilson (2019), local governments experienced pressure to use digital technologies and as a consequence established engagement methods, such as town hall meetings and consultation events, have given way in favor of online methods that facilitate communication between planners and citizens.

According to Jang and Kim (2019), online tools and georeferenced picture tags help researchers to create a mental map of the neighborhood and capture various aspects of the urban environment, including activities, ambiance, and senses. "This power in computing has allowed for new opportunities in producing interactive content, such as photo-realistic images and web technologies used for engaging people in place changes" (Wilson 2019, 87).

Overall, apps and websites are widely employed to enable citizen participation, and in this context the proposed visual questionnaire would be in the form of a photograph-based web page with three main sections: section 1: the participants' perceptions; section 2: the participants' role; and section 3: the participants' evaluation of the questionnaire. The first section will provide the participants with the opportunity to share information, evaluation, and ideas on three categories: related to past, present, and the future of the neighborhood. For defining their roles and responsibilities participants will be asked to rate their responsibilities regarding each plausible future alteration, in the second part, by employing charts instead of photos. Through the responses in this section, the participants clarify their status in regard to the community's issues and their relationship with the government. This section will be framed based on the Ten Seed Technique combined with the wholistic worldview analysis diagram. As the technique relies on right-brain function activated by visuals such as pictures, the full potential of the brain for perceptive analysis can be elicited (Jayakaran 2002, 7). In section 3, the participants will be asked to respond to a set of questions designed to elicit their ideas regarding working with the visual questionnaire, which will be used to inform the future development of the tool.

The first section of the questionnaire concerning the participants' perception will be defined by reviewing "the three basic elements of place identity proposed by Relp: physical settings, activities, and meaning" (Jang & Kim 2019, 2), and "the "gestalt-like" concept consisting of multiple dimensions that include physical distinctiveness, social imageability, emotional attachment, and satisfaction" (Jang & Kim 2019, 2), and in line with Lynch (1960), considering the shape, color, or arrangement as facilitators to make a vividly identified, powerfully structured, and beneficial mental images of the environment. To capture the participants' perceptions of the context, three main areas of interest are investigated: built environment, significance, and activities. The participants' ideas pertaining to each area will be investigated based on key variables (Figure 3).



**Figure 3.** The questionnaire's sections and framework. (Author, 2022)

For each variable, related photographs will be provided to help the participants reflect on the context. As Haklay et al. (2018) noted, there is a need to integrate new methods and techniques with old methodologies such as sketching. Therefore, in order to collect information pertaining to the past life of the locale, the tool will offer participants the chance to attach photographs and sketches and even to record their own voices as they tell their stories about the past as a contribution to envisioning the future. It will be instructive to consider the evaluative images and other attached files as a source for planners, as Al-Kodmany (2001) stated, in relation to deriving valuable information about how to improve the physical form of their communities. Additionally, an investigation of the images can also help define new variables for future development. The tool is expected to provide a common visual language that people can easily understand and use regardless of social class, education, and background, an opportunity for nonlocal planners and designers to learn about residents' perceptions and expectations, and (3) an opportunity for both citizens and planners to interact regardless of their geographical location at any given time.

## REFERENCES

- Aladalah, Mohammed, Yen Cheung , and Vincent Lee. 2015. "Enabling Citizen Participation in Gov 2.0: An Empowerment perspective." *Electronic Journal of e-Government* 77-93.
- Al-Kodmany, Kheir. 2001. "Online Tools for Public Participation." *Government Information* 329- 341.
- Al-Kodmany, Kheir. 2000. "Public Participation: Technology and Democracy." *Journal of Architectural Education* 220-228.
- Bobbio, Luigi. 2019. "Designing effective public participation." *Policy and Society, VOL. 38, NO. 1* 41–57.
- Brabham, Daren C. 2009. "Crowdsourcing the Public Participation Process for Planning Projects." *Planning Theory* 242- 262.
- Davids, Rene. 1999. "Serial Vision: Storyboards In The Design Studio." *87th ACSA ANNUAL MEETING*.
- Forester, John. 1999. *The Deliberative Practitioner; Encouraging Participatory Planning Process*. The MIT Press.
- Foth, Marcus, Bhishna Bajracharya, Ross Brown, and Greg Hearn. 2009. "The Second Life of urban planning? Using NeoGeography tools for community." *Location Based Services*.
- Glegg, Stephanie M. N. 2019. "Facilitating Interviews in Qualitative Research With Visual Tools: A Typology." *Qualitative Health Research, Vol 29* 301- 310.
- Haklay, Muki, Piotr Jankowski, and Zbigniew Zwoliński. 2018. "SELECTED MODERN METHODS AND TOOLS FOR PUBLIC PARTICIPATION IN URBAN PLANNING – A REVIEW." *QAESTIONES GEOGRAPHICAE* 127-149.
- Hoeven, Arno van der. 2019. "Historic urban landscapes on social media: The contributions of online narrative practices to urban heritage conservation." *City, Culture and Society* 17 61- 68.
- Jang, Kee Moon, and Youngchul Kim. 2019. "Crowd-sourced cognitive mapping: A new way of displaying people's cognitive perception of urban upace." *Plos One*, 14.
- Jayakaran, Ravi. 2002. *The Ten Seed Technique*.
- Jayakaran, Ravi. 2007. "Wholistic worldview analysis: understanding community realities." In *Participatory Learning and Action*, 41-48.
- Lelie, Corrie van der. 2006. "The value of storyboards in the product design process." *Pers Ubiquit Comput* 159–162.
- Lynch, Kevin. 1960. *The Image of the City*. Cambridge: MIT Press.
- Nelessen, Anton Clarence. 1994. *Visions For a New American Dream*. Chicago: Planners Press.
- Oliveira, Ana Roque de, and Maria Partidário. 2020. "You see what I mean? – A review of visual tools for inclusive public participation in EIA decision-making processes." *Environmental Impact Assessment Review*.

- Sannof, Henry. 1991. *Visual Reserch Method In Design*. New York.
2002. "The Ten Seed Technique: Learning How The Community Sees Itself." *Child Survival Connections*.
- UNESCO. 2011. "RECOMMENDATION ON THE HISTORIC URBAN LANDSCAPE." Paris.
- Varinlioğlu, G., Sepehr Vaez Afshar, Sarvin Eshaghi Balaban, and Ö., & Naga. 2022. "GIS-Based Educational Game through Low-Cost Virtual Tour Experience." *27th International Conference of the Association for Computer-Aided Architectural Design Research in Asia: Post Carbon, CAADRIA*. 69-78.
- Wilson, Alexander. 2019. *Technology-enabled planning participation: Designing & deploying digital technology to encourage citizen participation in urban planning*.
- Zhang, Shanqi. 2019. "Public participation in the Geoweb era: Defining a typology for geoparticipation in local governments." *Cities* 38-50.

**ARCC 2023 CONFERENCE PROCEEDINGS, APRIL 12-15, 2023**  
**THE RESEARCH DESIGN INTERFACE**

**CONFERENCE CO-CHAIRS:**  
Saif Haq and Zahra Safaverdi

**EDITORS:**  
Saif Haq and Adil Sharag-Eldin  
**EDITORIAL ASSISTANT:**  
Sepideh Niknia

**PUBLISHER: Architectural Research Centers Consortium, Inc.**  
**ISBN: 978-1-935129-33-2**