



Serious gaming to stimulate participatory urban tourism planning

Ko Koens , Jeroen Klijs , Jessika Weber-Sabil , Frans Melissen , Lidija Lalicic , Igor Mayer , Irem Önder & Carlo Aall

To cite this article: Ko Koens , Jeroen Klijs , Jessika Weber-Sabil , Frans Melissen , Lidija Lalicic , Igor Mayer , Irem Önder & Carlo Aall (2020): Serious gaming to stimulate participatory urban tourism planning, Journal of Sustainable Tourism, DOI: [10.1080/09669582.2020.1819301](https://doi.org/10.1080/09669582.2020.1819301)

To link to this article: <https://doi.org/10.1080/09669582.2020.1819301>



© 2020 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group



Published online: 22 Oct 2020.



Submit your article to this journal [↗](#)



Article views: 381



View related articles [↗](#)



View Crossmark data [↗](#)

Serious gaming to stimulate participatory urban tourism planning

Ko Koens^{a,b,c} , Jeroen Klijs^d , Jessika Weber-Sabil^e , Frans Melissen^b ,
Lidija Lalicić^f , Igor Mayer^e , Irem Önder^g  and Carlo Aall^h 

^aFaculty of Creative Business, Inholland University of Applied Sciences, Rotterdam, Netherlands; ^bAcademy for Hotel & Facility, Breda University of Applied Sciences, Breda, Netherlands; ^cSchool of Tourism and Hospitality Management, University of Johannesburg, Auckland Park, South Africa; ^dAcademy for Tourism, Breda University of Applied Sciences, Breda, Netherlands; ^eAcademy for Games & Media, Breda University of Applied Sciences, Breda, Netherlands; ^fDepartment of Tourism and Service Management, MODUL University Vienna, Vienna, Austria; ^gIsenberg School of Management, University of Massachusetts Amherst, Amherst, MA, USA; ^hEnvironment, Western Norway Research Institute, Sogndal, Norway

ABSTRACT

This paper examines how a serious game approach could support a participatory planning process by bringing stakeholders together to discuss interventions that assist the development of sustainable urban tourism. A serious policy game was designed and played in six European cities by a total of 73 participants, reflecting a diverse array of tourism stakeholders. By observing in-game experiences, a pre- and post-game survey and short interviews six months after playing the game, the process and impact of the game was investigated. While it proved difficult to evaluate the value of a serious game approach, results demonstrate that enacting real-life policymaking in a serious game setting can enable stakeholders to come together, and become more aware of the issues and complexities involved with urban tourism planning. This suggests a serious game can be used to stimulate the uptake of academic insights in a playful manner. However, it should be remembered that a game is a tool and does not, in itself, lead to inclusive participatory policymaking and more sustainable urban tourism planning. Consequently, care needs to be taken to ensure inclusiveness and prevent marginalization or disempowerment both within game-design and the political formation of a wider participatory planning approach.

ARTICLE HISTORY


Received 9 December 2019
Accepted 21 August 2020

KEYWORDS

Policy making; participatory planning; inclusive tourism; sustainable tourism; co-design; tourism transformation

Introduction

After years of relative neglect, reported unrest among residents in relation to tourism in European cities, has renewed interest in the negative social and environmental impacts of tourism (Hall, 2010; Koens et al., 2018). Academics, policymakers and practitioners now seem to agree that there is a need to better align tourism and wider urban planning to prevent so-called over-tourism and stimulate a resilient and sustainable development of tourism that can deal with uncertainty and crises (Innerhofer et al., 2018; Koens, Melissen, et al., 2019; Milano et al., 2019).

CONTACT Ko Koens  ko@kokoens.com  Faculty of Creative Business, Inholland University of Applied Sciences, Rotterdam, Netherlands; Academy for Hotel & Facility, Breda University of Applied Sciences, Breda, Netherlands; School of Tourism and Hospitality Management, University of Johannesburg, Auckland Park, South Africa

© 2020 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

This was recently underlined again by Gössling et al. (2020, p 15) in the context of the COVID-19 pandemic, as they argued that “there is an urgent need not to return to business-as-usual when the crisis [is] over”, but instead focus on delivering “a transformation of the global tourism system more aligned to the SDGs” (Sustainable Development Goals).

The goal of a more integrated tourism planning, in close relationship with other urban functions is far from new and was already argued for nearly 30 years ago (Jansen-Verbeke, 1992). However, the implementation of governance change in a context of wider societal developments and intricate power relations still remains under-researched (Dredge & Jamal, 2015). This is exemplified by the plethora of overtourism publications, which mostly focused on the impact of the tourism sector in itself and ways to mitigate its negative impacts (e.g. using policies, tools and apps). Much less attention was given to the question of *how* to instigate wider systemic changes to come to more sustainable tourism and mobility patterns (Koens, Postma, et al., 2019; Romero-García et al., 2019).

To answer that question requires engagement with broader societal debates and stakeholders with a specific eye on issues like participation and community engagement, whilst acknowledging intrinsic conflicts of interests, tensions, and power relations (Dredge & Jamal, 2015). Limited contact between stakeholders, a perceived lack of influence over developments and the difficulty of achieving interdisciplinary, cross-boundary collaborations are critical issues however, that hinder progress towards a sustainable development of urban tourism (Boom et al., 2020; Edwards et al., 2008). In domains like planning, design and innovation studies different forms of citizen engagement are experimented with, to overcome such issues (see e.g. Legacy, 2017; Smeenk et al., 2019; Webb et al., 2018). In tourism however, community input in participatory planning is “mostly confined to public consultation with limited impact on the actual shaping of policies” and academic understanding on the issue remains fragmentary (Dragouni et al., 2018, p. 761).

The current paper aims to further understanding on this topic by critically analysing the benefits and limitations of a design-based serious gaming approach for use in participatory tourism planning. Its main research question focuses on the extent to which a game can support stakeholders from within and outside of tourism to discuss and reflect on potential tourism interventions. As such, it is among the first academic papers to analyse a serious game specifically designed for participatory urban tourism planning and it provides three main contributions to the academic literature. To start with, a serious game is introduced, based on academic underpinnings, to bring together stakeholders and help them discuss and reflect on potential interventions that can assist destinations in achieving sustainable urban tourism. By analysing gameplay and the impact of game sessions in six European cities a better understanding of the ways in which serious games can help build knowledge and shared understandings on tourism development in a systemic context is gained, which is the second main contribution. Finally, the relevance of the increasingly popular concept of design-thinking in tourism to bridge the “persistent relevance gap between theory and practice” (Romme, 2003, p. 558) is discussed and recommendations are made for such an approach to become more relevant and impactful in the context of participatory planning.

Literature review

Towards a participatory approach to sustainable urban tourism

Interest in the sustainable management of urban tourism can be traced back to the early work on seaside resorts, which resulted in the tourism area lifecycle (Ashworth & Page, 2011; Butler, 1980). Throughout the 1980s and 1990s the management of tourism remained high on the agenda. This resulted in advanced models to monitor the perceived impact and levels of acceptable change within host societies (McCool & Lime, 2001), as well as environmental impacts (Peeters & Schouten, 2006). Notwithstanding their usefulness, such contributions have been criticized for oversimplifying tourism as a management problem and ignoring the broader role and social impact of tourism in societies and environmental problems of transport to and from



Source: (Koens, Melissen et al., 2019)

Figure 1. Smart City Hospitality Framework value framework.

Source: (Koens, Melissen, et al., 2019).

destinations (Høyer, 2000). In practice, the presumed desirability or inevitability of continued economic growth has remained an underlying assumption which overrides social and environmental concerns in tourism development (Aall, 2014; Hall, 2010; Timur & Getz, 2009). ‘Solutions’ for attaining sustainable (urban) tourism development often consist of adaptive tourism policy measures that increase tourism capacity rather than a systemic transformation towards sustainability (Koens, Postma, et al., 2019). At the same time, ‘smart’ tools, and the promise of using big data to measure impacts and manage visitor streams further instrumental thinking and technological solutionism in this context (Cohen & Hopkins, 2019). However, many issues in tourism are social in nature and cannot be solved with technical solutions alone. Instead, addressing the complex challenges that tourism faces, require new dialogues and collaborations with many actors from within and outside of tourism (Phi & Dredge, 2019).

Within the context of the project “Implementing energy efficient and social urban tourism solutions and creating citizen empowerment through Smart City Hospitality” (SCITHOS), a ‘Smart City Hospitality Framework’ was introduced with the explicit aim to increase dialogue by providing stakeholders with a point of reference regarding the role that tourism can play in a wider city transformation (Koens, Melissen, et al., 2019, p.6). It combines a triple-p (people, planet profit) conceptualization that is commonly used to define sustainable tourism with three additional city hospitality values that focus on the quality of a city as a host to all users (Figure 1). Within this framework, the triple-p perspective is operationalised as: 1) *natural viability*, the ability of the natural (eco)system, locally and globally, to support the needs and wishes of current and future generations; 2) *equitability*, a fair distribution of economic wealth and other costs and benefits and; 3) *economic wealth*, the value of all the assets of worth owned by individuals, communities, companies or government, locally and globally. These values are combined with three city hospitality values: 4) *liveability*, the quality (level) of the city as a place to live and work; 5) *experience quality*, the quality of the city to as a provider of experiences from a leisure perspective and; 6) *smart hospitality*, the level to which stakeholders are stimulated and enabled to jointly shape the city’s urban tourism system (Koens, Melissen, et al., 2019).

Whilst the Smart City Hospitality framework provides a framework for stakeholders to jointly discuss how to develop sustainable tourism, it is not evident that this will happen in a sector where actors mostly “talk about each other instead of with each other” (Melissen et al., 2016, p.149). Indeed, whilst collaboration and participatory planning have been part of the tourism lexicon for years (see e.g. Bramwell & Lane, 2000), it has proven difficult to implement collaborative principles in practice. Participatory planning is a chaotic and messy social-political process where many inter-dependent stakeholders have to work together towards solutions. Commonly reported problems are a lack of time and resources, a lack of trust between stakeholders, difficulty to find consensus, unwillingness to share power and doubts about the quality of collaborative decisions (Dragouni et al., 2018; Marzuki et al., 2012). These issues are particularly evident when stakeholders have little contact and different interests, expertise and experience (Smeenk et al., 2019). Nonetheless, stakeholders from within *and* outside of tourism (with different interests, expertise, and experience) will have to come to a shared understanding on how to transform tourism to enable it to contribute to systemic sustainable city development (Healey, 2006; Pasquinelli & Trunfio, 2020).

This cannot be achieved only by generating ‘objective’, scientific knowledge. For example, computer models and simulations are highly useful to provide likely outcomes and solutions with regards to complex (urban) systems. However, in the context of participatory policymaking “computer simulations of complex systems have a serious handicap: They are unable to cope with the unpredictable, strategic and frequently irrational behaviour exhibited by real people and organisations... [they] do not accommodate the political dimensions of multi-actor decision making processes” (Mayer, 2009, p.844). As such, if academia wants to contribute to this debate, it will need to engage also with creative methods that allow for problem and solution to co-emerge. The term ‘design thinking’ is often used as an overarching term to describe such approaches to dealing with complexity, where potential solutions are explored, evaluated and improved in an iterative and structured way (Smit & Melissen, 2018; Stompff, 2012), allowing for ‘reflective conversations with the situation at hand’ (Schön, 1983) and collaboratively exploring implications of possible interventions (Cross, 2011). Ideally, applying design thinking leads to what Cross (2011, p.23) describes as “an interactive process based on posing a problem frame and exploring its implications in ‘moves’ that investigate the arising solution possibilities.” An innovative methodology that is particularly suited to and applied for generating such a process is serious gaming (Gugerell & Zuidema, 2017; Mayer, 2009), which forms the focal point of the rest of this paper.

Using serious gaming to support tourism planning

The concept of serious gaming arose from experiences with military strategy gaming but has, since the 1950s, also been applied in business, education and science (Rosner & Abt, 1970). Whilst its use in tourism studies has up until now been limited, the potential for using serious games has already been recognised (Peeters et al., 2014). Serious gaming uses principles of play and gaming to achieve objectives that are valued not for their intrinsic value, i.e., merely for the sake of entertainment, but for their extrinsic value of learning and instigating change. Players can have ‘fun’ playing the game, but the higher, ‘serious’ game purpose of fostering learning underlies the motivation of play (Crookall, 2010; Suttie et al., 2012). The overall aim of a serious game session is to create more awareness and understanding of an underlying topic among participants in a ‘safe environment’, through player engagement with the game as well as with other players (Keijser et al., 2018). Serious gaming is one of the few methods in the policy analysis toolbox that allows for stakeholders to interact directly with the outcomes of academic research (Mayer, 2009). As such, it has the potential to act as a mediating layer that allows for a better uptake of academic knowledge in practice.

To provide a suitable learning environment, serious games commonly use a simplified representational model of reality. To create a working model, it is necessary to have a good

understanding of the characteristics, complexities and diversities of the issue that the game seeks to explore (Peters et al., 1998). Without substantive input, evidence and analysis (e.g. by means of a computer model) of actual impacts, games run the risk of degenerating into superficial venting of desires and viewpoints or negotiated nonsense. This may lead to low-quality and rather shallow discussions or can even result in outcomes that are in conflict with reality (Mayer, 2009). For urban tourism that means that the different and actual impacts of interventions aimed at creating sustainable urban tourism on city destinations need to be identified and clarified, in this case using the aforementioned Smart City Hospitality Framework. The relations between the values in this framework allow for different ways of framing tourism impacts that stakeholders can reflect on (Boom et al., 2020), which makes it well suited within the context of a serious game that deals with tourism development.

Methods

Serious gaming in practice: design of the smart city hospitality challenge

To facilitate stakeholders to create a joint understanding of and collaboratively reflect on tourism planning, a computer-supported, multiplayer (serious) game was developed in late 2018. The goal of the game was twofold: 1) to develop a game that provides a notion of the complexity of sustainable urban tourism systems and 2) to stimulate communication and joint reflection on the planning process, with an eye on stimulating future cooperation (Mayer, 2009). The target audience is professionals from government and industry, as well as resident representatives and environmental NGOs with an affinity to sustainable tourism planning. The game is played on a 1.5×1.5 m game board that consists of a modular set of hexagon shaped tiles. The board was designed to allow players to walk around it and start discussions with a number of different players. To symbolize city infrastructure, such as hotels, theme parks, transportation categories and tourist attractions, 3D printed miniatures were used (Figure 2).

The game was developed as a multiplayer physical board game play with a strong focus on face-to-face roleplaying engagement through communication, negotiation and social learning through natural conversations (Mayer, 2009; Mirowski, 2002). In this way, the game is meant as a platform for a design dialogue about sustainable tourism planning. A story and stimulation (SAS) approach is implemented (Mendoza & Prabhu, 2005). Players are introduced to a contextual storyline under the lead of two facilitators. This makes it easier for inexperienced players to participate and allows for greater flexibility during gameplay.

To help understand the complexity of sustainable urban tourism development, a digital simulation model was developed, based on the Smart City Hospitality framework. The calculations for this model are based on extensive desk research, over 80 interviews with city stakeholders, and discussions with the representatives of the six cities where the game was eventually played (Boom et al., 2020; Koens, Melissen, et al., 2019). The state of the city and relevant changes are visualized on a digital game dashboard which is projected on a large screen for all players to see (Figure 3). This dashboard displays the overarching scores for all six values of the Smart City



Figure 2. Game setting: game board in the centre, policy cards on the sides, and digital game dashboard in the back.

Hospitality Framework, while four resident and visitor personas - archetypes that represent fictional groups of people (Pruitt & Grudin, 2003) – are used to highlight liveability and experience quality (visibility). Finally, the game dashboard shows the extent to which certain facilities, attractions and infrastructure are overutilized or underutilised as well as their ecological impact (e.g. noise, CO² emissions). The simulation model and dashboard are designed to support the physical game. They are not prescriptive and do not provide players with clear outcomes, guidelines and solutions with regard to the ‘best’ way forward. Instead, outcomes are diverse, multifaceted and may be counterintuitive, thus highlighting the complexity of tourism planning with an eye on contributing to a debate (Meadows & Robinson, 2002).

Gameplay takes up to four hours, during which three to four rounds are played. Players are divided into five stakeholder teams, which represent common tourism stakeholders in a city (destination management; hospitality; attractions; mobility; ecology). During the game, players modify and develop the city by removing, building, or replacing the city infrastructure, or by playing policy cards (e.g. regulating facilities like nightclubs, or electrifying public transport). The actions on the policy cards were created in such a way that they are realistic, but also lead to a useful game experience. They were based on interviews with city-stakeholders, in-depth discussions with a smaller group of city representatives and a series of iterations in game design. Players select and suggest infrastructure and policy propositions for a vote, which leads to a final decision on what to do. This influences the satisfaction of the personas of visitors and residents as well as the scores for the overarching six values, all of which are displayed on the digital game dashboard. When the scores have been calculated, players are encouraged to interpret and discuss the impacts of their actions as visualised on the game dashboard. After discussing the results for approximately 10 minutes, depending on the depth and focus of the discussion, the facilitator starts another round of play where, the same procedure repeats itself, or the final debriefing when the game is at an end.

The game was beta-tested in Amsterdam in January 2019, after which it was played in six European cities: Amsterdam, Belgrade, Darmstadt, Gothenburg, Stavanger and Valencia. These cities were purposefully selected as they are all interested in improving participatory tourism planning but differ with regards to geographical location, spatial outlay, the number of residents and visitors they host, the facilities they offer and the main debates regarding tourism planning

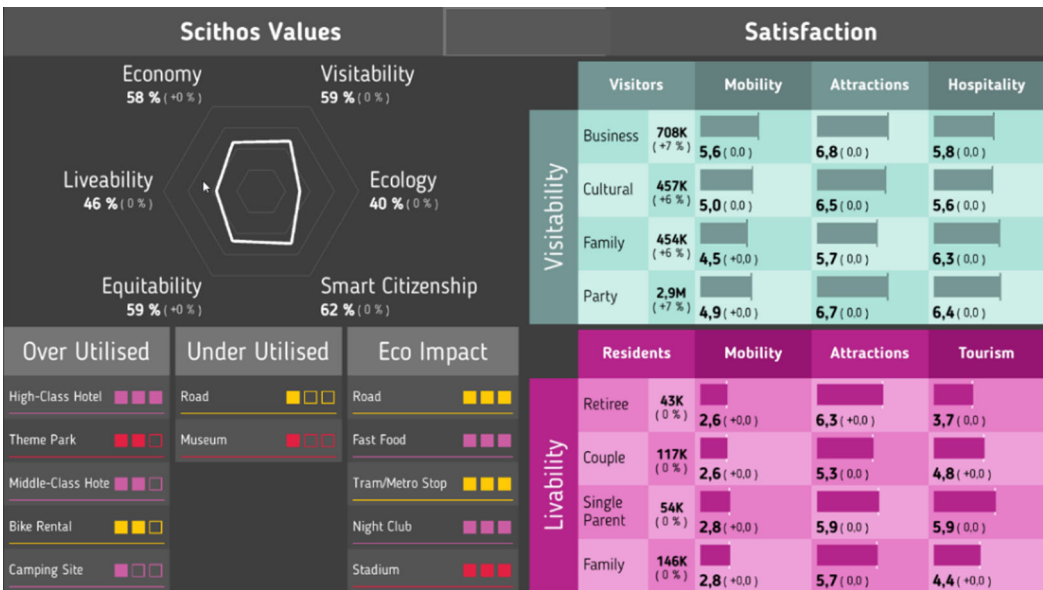


Figure 3. Game dashboard - the Smart City Hospitality framework can be seen in the top left corner.

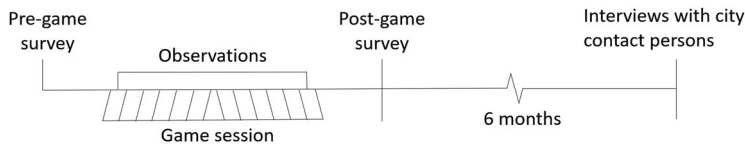


Figure 4. Timing of data gathering methods.

– ranging from facing overtourism to starting to grow tourism efforts. As such, these cases allowed for an investigation of how the game works in a diversity of contexts and environments (Stake, 2013; Urioste-Stone et al., 2018). The game was played 10–17 stakeholders in each city, as it works best with 10–20 participants. This meant that in total by 73 players participated. Players were purposively selected in collaboration with local city representative, with the ambition to get a range of stakeholders (including policymakers, business owners, and representatives of residents, environmental organisations or academia) that is relevant to the real-world context of the individual cities. Around a third of all participants worked directly in tourism, but most did not. A list of participants can be found in [Appendix 1](#). In contrast to the other cities, participants for the game in Belgrade were mostly students, with less policymakers and industry professionals present. As discussed in the final section this highlights a weakness of this approach and resulted in the quantitative data regarding game experiences from Belgrade not being used.

Methodology for measuring impacts

A mixed methods approach was used to strike a balance between academic rigour and richness of data gathering, as well as practical possibilities in the context of serious gaming research with real-world stakeholders. A quantitative survey (Likert scales 1–5) was performed prior to and after playing the game to measure the effect of the game as an intervention, while qualitative measures were used to gauge gameplay, game performance, game experience and effect (Mayer et al., 2014). As such, the research has an interactive, sequential design with parity given to both quantitative and qualitative methodologies designed to function in conjunction with each other, even when they were largely performed at different stages ([Figure 4](#); Greene, 2008).

While the researchers tried to persuade all players to fill in both the pre- and post-game survey, this was not always possible. In the end, 55 players completed the pre- and post-game survey. As a result, the quantitative outcomes remain largely descriptive, with the exception of a small number of Chi-square tests. Therefore, the qualitative outcomes are used to provide a more in-depth understanding of game processes and experiences.

The average age of players was 39 years. A slightly higher than average proportion were women ([Table 1](#)). Most players worked in the public sector and had experience of working in tourism. Only 20% had played a serious game before.

The pre-game survey aimed to measure players' knowledge of tourism and tourism planning and their attitude toward tourism (Nunkoo, 2015). Furthermore, players had to indicate to what extent aspects of sustainable tourism planning are already established in the city and how important these areas are for them (based on Mayer et al., 2014). The post-game survey focused more on the players' experience with the game and game design, and learning outcomes related to the complexity of tourism planning and intentions to be more involved in future tourism planning practices (based on scales from Keijser et al., 2018; Mayer et al., 2014; Nunkoo, 2015).

During the game, conversations and actions were logged by two observing researchers who were not involved in the facilitation of the game. The aim here was to better understand the gameplay processes and context. Although no specific protocol was used, the observing researchers focused on: 1) the extent to which different players interacted; 2) the different ways of interaction (e.g. cooperative or competitive); 3) players' interpretation of events and outcomes of the game during debriefing moments; 4) significant events during the gameplay. Observations were written down in

Table 1. Demographic characteristics players ($n = 55$).

Gender	Female	60%
	Male	40%
Work profile	Public sector	64%
	Private sector	26%
	Non-profit sector	11%
Work in tourism	Yes	70%
	No	30%
Previous game experience	Yes	20%
	No	80%

notebooks for comparison between observers and different game sessions. Besides the observation, three open questions were posed at the end of the survey to capture the overall game experience. Finally, to understand the longer-term impact and gain further overall reflections on the use of a serious game in governance, the contact persons of the cities were contacted six months after the game was played in their city. Short 10-minute interviews were held over the phone by two researchers, the results of which were analysed by listening back and writing out key sections.

Results

Findings on pre-game expectations

Before the game started, players were asked about tourism in their city (Table 2). While they recognised the importance of tourism as an industry, their overall satisfaction with the current state of tourism was relatively low. Players noted that decisions are often taken by the same stakeholders and they were not overly positive about ways to influence tourism in their city.

With regards to the planning of tourism, players were most positive with the vision and ambition that was proclaimed (Table 3). They were less certain about the extent to which the vision is translated into clear objectives and implemented. This trend was observed in all cities, albeit that in Amsterdam the differences between these scores were greater than in the other cities. A low average score was given on the extent to which science- and evidence-based planning was implemented, which suggests current research has relatively limited impact.

When asked about learning outcomes from the game (Table 4), players generally expected that playing would allow them to learn about social aspects of tourism governance. In particular, they expected to become aware of connections between different stakeholders and to think more beyond disciplinary boundaries. Gaining insights into the complexities of tourism planning were expected to a lesser extent, as were practical gains, such as learning how to work together or to practice in a safe environment. The low scores for the latter two items may be due to players inexperience with serious gaming, as they are generally viewed as important potential learning outcomes of a serious gaming approach (Mayer et al., 2014).

Findings on gameplay and session outcomes

Initially, some players were a bit weary of the concept of 'playing a game' to discuss participatory planning, as opposed to a more traditional meeting or workshop setting. However, after the first 'warm-up' round players quickly became enthusiastic and engaged. Gameplay followed a similar pattern in most cities, with teams initially seeking limited contact with each other, or competing to get their policy measures accepted instead of other team's policy measures, as they tried to 'win' the round. This commonly resulted in what was perceived as suboptimal results, either because the six Smart City Hospitality value scores deteriorated, key issues were not solved, or specific personas were not served well. Following a reflection on the results after the first round(s), teams and players began to act more cooperatively. They also started to

Table 2. Attitudes towards tourism and tourism planning ($n = 55$).

Attitudes towards tourism¹	Avg. score (std)
Tourism is an important industry for the city	4.61 (.83)
Tourism decisions are always made by the same stakeholders	3.70 (1.00)
I know how I can impact tourism development in my city	3.43 (.91)
Overall, I am satisfied with the current state of tourism in the city	3.23 (.91)

¹1 = completely disagree – 5 = completely agree.

Table 3. Evaluation of tourism planning ($n = 55$).

Evaluation of tourism planning¹	
Vision and ambition of tourism planning	3.71 (.85)
Implementation of guidelines	3.32 (.75)
Clear objectives	3.28 (.87)
Science- and evidence-based planning	3.17 (.95)

¹1 = Completely not established – 5 = completely established.

Table 4. Players' expected learning outcomes – complexity of tourism planning ($n = 55$).

Expected learning outcome¹	
Learn to see connections between stakeholders	4.16 (.90)
Learn to think beyond disciplinary boundaries	4.15 (.80)
Learn to work together	3.78 (.85)
Gain better insights in tourism planning	3.76 (.88)
Practice in a safe environment	3.74 (1.00)

¹1 = completely agree – 5 completely disagree.

explain more why they felt certain policy measures were important, using examples from their real-world experience. A short summary of the gameplay in the six cities is provided in [Table 5](#).

Players in the Northern European cities were quick to start discussions about what should be the priorities within their city and then choosing policies together to address these priorities from the start. In the Gothenburg session in particular, players immediately started to work together. This may be because government is represented in advisory boards of many of the main stakeholders (e.g., harbour, stadium) in this city, fostering a culture of understanding and cooperation. However, even in this city, players found new points for discussion regarding development of tourism and how this could be dealt with in a more integral way as gameplay moved on.

Once teams realized that to get the results they collectively wanted, a more holistic approach was needed, they started to work together more. Naturally, not all players agreed with certain actions and compromises were made. This caused frictions, but these did not limit further interactions. To lower tensions, players made jokes about disputes or argued they were 'only playing a game'. As gameplay went on, players also started to communicate more explicitly, also about their underlying goals and ideas and why certain 'solutions' would not work in real-life. This mix between fictive gameplay and the sharing of real-life experiences was seen as useful by the players, who mentioned they learnt new insights from others with whom they normally would have little contact (e.g. urban planners and tour operators). The mix of reality and fiction could not be observed in all cities (e.g. in Belgrade it proved difficult with mostly students playing the game), but where it happened, it was seen as very valuable.

A striking finding from observing the gameplay was that the focus was very much on achieving short-term gains that related directly to immediate issues that players observed on the game dashboard, or that were evident in their city and had 'political' momentum. This remained the case, even after teams had started working together. Long-term issues of which effects were not directly evident and palpable, received far less attention. For example, only in the Stavanger game, where it is high on the political and media agenda due to the perceived need to move away from the city's reliance on the oil industry, did climate change receive significant attention. In the other cities, climate change was barely mentioned during the game, even when all cities can be expected to be strongly affected by the impacts of climate change.

Table 5. Summary of gameplay in the cities.

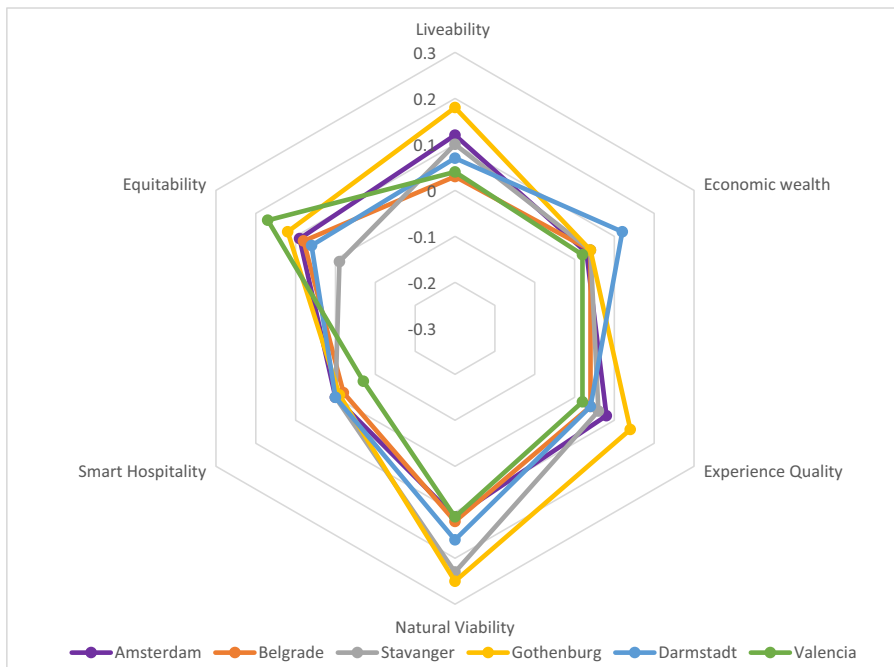
Amsterdam	Players were quick to engage and had open discussions with people in other teams. Their main concern was the liveability of the city and players emphasised policies that enhanced residents' and visitors' mutual acceptance and equitability. Great effort was also put on dealing with short term rental services and optimising city infrastructure. Relatively little emphasis was put on economic and environmental aspects in the city.
Belgrade	Few real-life stakeholders participated, which might have altered gameplay. There was relatively little cooperation between different groups and the discussions were driven strongly by a small group of professional actors involved. Mobility and the environment were important topics and were improved, but some of the measures to deal with liveability and experience quality had opposing effects and cancelled each other out.
Darmstadt	Gameplay was lively, although it took some time before players started to work together. While there is room for tourism growth in the city, the emphasis was strongly on sustainable transportation and experiences throughout the game, which also contributed to improved liveability and experience quality scores.
Gothenburg	The game could be characterised by the great level of deliberation and instant cooperation between players. Equitability and the ecological impact were the dominant themes in the discussion, although players also sought to maintain the already high standards for other values.
Stavanger	Gameplay focused on collective solutions. As the city has room for tourism growth, players focused on tourism growth and experience quality in a sustainable way. In the second part of the game the emphasis switched to liveability, even when players continued to keep an eye on ensuring natural viability scores remained high.
Valencia	In Valencia gameplay was lively as players discussed for long periods of times about the different perspectives. In the end players agreed to follow a strategy of tourism growth, while maintaining liveability and limiting environmental damage.

Source: Authors, based on (Weber-Sabil et al., 2019).

This can also be observed when looking at the final result of the different cities, as visualized by the Smart City Hospitality framework value scores (Figure 5). Whilst it is important to realise that the outcomes do not represent the real situation within the city (given the small number of people playing and the gameboards represented highly stylized representations of the actual cities), outcomes do provide some interesting insights.

All cities 'improved' their scores in one way or another, with the most positive scores achieved in Gothenburg, while in Belgrade scores being somewhat lower. It is possible to observe focus points in the cities, though. Particularly in the Northern European cities natural viability was rated highly. As mentioned previously, Stavanger was the only city where climate change was discussed extensively, whilst in Gothenburg there was a deliberate strategy not to compromise on environmental issues as a whole. Belgrade too mostly increased their environmental score, which could be related to the ongoing discussions of reducing pollutions and greening the city centre. In cities where overtourism is higher on the agenda, the emphasis was much less on environmental issues. In Amsterdam, a very balanced perspective was taken with a relatively strong emphasis on liveability and equitability, at the expense of economic wealth. In Valencia, equitability was very important. This fits with the overarching discussions in both cities; the balanced city approach in Amsterdam (Gemeente Amsterdam, 2018) and the strong impact of social movements in Valencia (Mansilla & Milano, 2018). In Darmstadt, which had not really experienced overtourism, there was a relative positive perspective on economic growth. In all other cities, economic wealth creation was limited, even when in most cities economic growth remains a dominant paradigm (Boom et al., 2020; Fletcher et al., 2019).

An intriguing observation is that smart hospitality changed very little, or even decreased in all cities. This may be because players were unused to actively engage citizens in their decision making. Indeed, players in nearly all cities acknowledged the game had helped them point out that this is a potential issue in their city. At the same time, this may be because the value proved difficult to explain, particularly when resident representatives played the game. Also, some may have had difficulty to differentiate this value from equitability, which may have reduced the validity of this element in the game (Weber-Sabil et al., 2019).



Source: authors, based on (Weber-Sabil et al., 2019)

Figure 5. Changes of the scores of the Smart City Hospitality Framework between start and end of the game.

Source: Authors, based on (Weber-Sabil et al., 2019).

Findings reflecting players' post-game experience

After finishing the game, players noted the game provided an enjoyable positive learning atmosphere. This was confirmed in the survey afterwards, in which players indicated that they thought the game stimulated creative thinking and was fun to play (Table 6). The enjoyment of the game also came out in the fact that players were very likely to recommend the game to others.

A point of critique was that players felt a bit overwhelmed due to the large set of different choices and outcomes. Particularly at the start of the game this proved a struggle. At the same time, this was seen as a highly valuable aspect of the game by players, as it emphasised the complexity of tourism development. The Smart City Hospitality framework was perceived by the players as realistic and helpful in shaping and structuring the debates during gameplay. The use of personas was appreciated as it highlighted that not all visitors and residents have the same interests and that it is impossible to please all simultaneously. In addition, the use of personas showed that decisions which may have limited impact on the city as a whole, can have great impact on individual groups of people:

"[the game] certainly helps to understand the complexity of a city and that tourism is a part of or affected by many decisions and policies, but also, that small steps or projects can have a huge impact for [sic] certain stakeholders (Interviewee D14)"

Players noted they were already aware of the need for cooperation and collaboration, but that playing the game made this even more visible but also highlighted the difficulties involved. The game made clear that players could and probably should interact (more) with other relevant stakeholders, also those they have not met before (in real life). This confirmed the finding from the literature review that a lack of contact between key stakeholders is one of the most problematic issues hindering more holistic urban tourism planning (Boom et al., 2020; Edwards et al., 2008; Koens, Postma, et al., 2018, 2019). Players also appreciated that the game had stimulated open and direct communication. The "discovery of different perspectives", as one player (interviewee G10) called it, increased their understanding of the challenges different stakeholders face.

Table 6. Experience of the game ($n = 55$).

Game experience¹	
I am likely to recommend this game to others	4.48 (.60)
I think the game is fun	4.47 (.54)
I felt creative whilst playing the game	4.13 (.75)
I think it is easy to learn how to play the game	3.78 (.74)

¹1 = completely disagree – 5 = completely agree.

Another learning point that players referred to, was the hard choices that have to be made at times. This was related to the perceived need for leadership in their own city when it comes to implementing management strategies and moving beyond easy-to-attain goals.

The survey confirms that participation in the game led to players gaining new insights into the complexity, long-term effects and pitfalls of tourism planning and gave them ideas to strengthen tourism planning (processes) in their city (Table 7). On the matter of stakeholder engagement, outcomes confirm observations from the gameplay and the expectations of players that the game promoted collaboration as well as communication between stakeholders. Furthermore, results confirm that players felt the discussions and interactions during the game led to a better understanding of conflict and cooperation in tourism planning.

Reflecting on the gameplay, players indicated that they particularly enjoyed the interaction that the game offered. As mentioned before, the discussions underlined the need to better understand the needs and perspectives of different stakeholder groups. This was strengthened by the roleplay elements of game - the ability to play a different role than the one they had in daily life - and the need to work together as a team with people from other lines of work.

"I liked that teams were mixed and with people not normally having contact working together. And that despite of the team structure you worked with everyone... A planning process always needs many stakeholders to be involved to be successful" (interviewee D14)

A more in-depth analysis of the impact of players' experience and attitudes on their perceived learning outcomes was performed using Chi-square analyses. This revealed that roleplay in particular led to a greater enjoyment of the game among players ($p < .05$) and that the interactive elements and game dashboard significantly influenced players' feelings of encouragement during the game session ($p < .05$). Most importantly however, results showed that having fun while playing the game significantly impacted all the expected learning outcomes related to the complexity of tourism planning ($p < .005$). This confirms findings from the literature that a game-based approach is particularly useful in supporting people to understand highly complex issues and processes that are not easy to grasp using paper-based means of communication.

In addition, results suggest that the game worked best when there was already a level of openness among stakeholders. Players who expected to work together in the game also indicated afterwards that the game gave them more insights related to tourism planning ($p < .05$). Players who in the pre-game survey indicated that they believed gameplay would help them to think beyond existing boundaries felt more positive about game outcomes. In particular, they noted more than others that the game taught them how to contribute to tourism planning ($p < .05$), that they now know better what tourism planning means ($p < .001$), and that they can now better imagine other stakeholders' viewpoints ($p < .05$). Such results suggest that to maximise the impact of the game, it is necessary to prepare players on this matter. In the current setting, not all players were completely aware of what a 'serious game' session entailed and may have been somewhat derogative towards such a playful approach, even when they all had received an invite explaining the concept.

Findings on long-term impact of a serious game approach

In the follow up interviews, six months after playing the game, the contact persons all reported they had received positive feedback about the game. Playing the game was seen as beneficial to

Table 7. Perceived learning outcomes of the Smart City Hospitality game ($n = 55$).

Perceived learning outcomes¹	
The game promotes collaboration on urban tourism planning between stakeholders	4.51 (.64)
The game promotes good communication between stakeholders of urban tourism	
I gained more insights into what the important factors in tourism planning are and how they influence each other	4.25 (.75)
I can better imagine the different viewpoints of stakeholders involved in tourism planning	4.22 (.66)
I have become more interested in certain in tourism planning	4.13 (.94)
I have a clearer picture of how stakeholders can participate in tourism planning	4.02 (.62)
I gained useful ideas for strengthening tourism planning in the city	4.00 (.77)
I gained more insights into how to plan tourism in the city and the complexity of it	3.98 (.90)
I gained more insights into conflict and co-operation between involving stakeholders for planning	3.96 (.82)
I know better what tourism planning means	3.94 (.99)

¹1 = completely disagree – 5 = completely agree.

help understand tourism decision-making processes. Overall, contact persons felt that the serious gaming session had been a valuable learning experience for everyone who played the game. The game had improved the understanding of city planning and tourism development concepts among stakeholders, as well as the consequences of decisions and how much tourism is related to different aspects of urban planning. The ways in which the game had shown the importance of involving and communicating with different stakeholders was particularly appreciated.

“... it has been a good opportunity to share the experience with stakeholders. The game offers a good opportunity to involve stakeholders that are not used to [being involved] and to give them a broader view of the impacts of tourism” (interviewee V1)

On the other hand, contact persons also noted that there was only a slight indication that the game had contributed to a change in decision making processes for tourism or city planning in general. The game may have had a positive contribution for the thinking on tourism, but as a one-off, its impact had been limited. To have a more long-term effect, they noted that the game should receive regular follow-up. Alternatively, it was mentioned it could be useful to play the game with politicians, as these can have a more direct impact in moving from a vision to a more practical implementation and set in motion further cooperation between different stakeholders.

Discussion

This paper is among the first to introduce a design-based serious game approach to stimulate participatory planning as a means to support interventions to achieve sustainable urban tourism. It specifically set out to analyze the extent to which a game can support stakeholders from within and outside of tourism to discuss and reflect on potential tourism interventions. Findings suggest that the serious game approach is useful in that it managed to bring together stakeholders with very different backgrounds and interests. At the same time, serious gaming is not a panacea, and, while measuring the impacts of a gaming approach is not without difficulties, current findings reveal clear limitations to what a game can achieve, particularly as a one-off activity, as will be discussed further below.

Methodological implications

Trying to gauge the impact and effectiveness of a serious game requires tools that allow for a natural and uninterrupted flow of the gameplay, but also provide sufficient information to critically assess the outcomes and help provide improvement points. The mixed methods approach as employed in this study made it possible to gauge the possibilities and limitations of both qualitative and quantitative methods. It was found that serious gaming approaches are not necessarily easy to test with quantitative tools like surveys. Game sessions often have a limited number of participants and after a long, intense session, it is not easy to persuade participants to focus on a

survey. In addition, different contextual circumstances, and small sample size per city, make it difficult to get a representative sample of players, which limits possibilities for doing statistical testing.

In the current research, qualitative methods were used to overcome some of these issues. Such methods proved particularly useful to evaluate the ways in which participants worked together. However, it remained difficult to gain insights into the group dynamics, particularly between individual participants, or changes in perspectives within individuals as the game progressed. In addition, the game was played in English in most cities, but stakeholders regularly had discussions in their native tongue. Although a fluent speaker assisted the facilitator, this may still have led to useful information being missed. Recording the game sessions on video could have been useful to overcome issues like these, whilst a more structured discussion on the basis of the framework after each round, could also improve understanding of the game as it is being played.

All in all, evaluating the quality, reliability and validity of gameplay and outcomes may require other methodologies than are normally used when evaluating policymaking. Such methodologies could be qualitative in nature, but also quantitative approaches that require less participants (e.g. q-sort studies) may be useful. One recommendation of the paper therefore is to further investigate methodologies that may better fit with serious gaming and similar design-led interventions, particularly as such approaches appear to be gaining in popularity.

Managerial implications

By creating a specific experience where different stakeholders can come together and reflect on wider and long-term goals for the city as a whole, the game was found to be a useful tool in a participatory planning process. It provided players with opportunities to jointly reflect on the tourism planning process, whilst sharing real-life experiences. The game was particularly useful as a tool to support stakeholders to appreciate the complexities of tourism development in relation to overall city development. It can help practitioners to increase their awareness and appreciation of different perspectives, as well as the limitations of focusing on consensus and trying to define an 'objective' best way forward. It is noteworthy that the game combined such learning experiences with an enjoyable experience for the players. Even players who were initially sceptical of playing a game, felt afterwards that playing the game was a memorable experience, far more so than attending a presentation or reading a report.

Gameplay works best with a diverse group of stakeholders with knowledge of tourism and even then, it is important to employ structured debriefings to provide transparent communication on outcomes (Weber-Sabil et al., 2019). In addition, a certain level of willingness to openly discuss different perspectives and ideas is required, as it is the discussions that are the key learning elements. In the current game, it proved difficult to get players to relate to the value of smart citizenship, which may reflect their real-world perspective, but may also be a point of improvement for the game and/or model underlying it.

At the same time, the main outcomes in all cities fit with the dominant policy narratives, which suggests that the game is methodologically able to reflect differences in policy goals, policymaking styles, and real-life issues, and allows players to move beyond feeling they are just playing a game (Lalicic & Weber-Sabil, 2019).

Although the game can be seen to contribute to stimulate participatory planning processes, it is important to remain wary that serious games are merely tools to support participatory planning. Failure to do so, means there is a very real risk of technological solutionism (Cohen & Hopkins, 2019). In fact, one stakeholder mentioned that her expectation before the game was that it would provide her with the 'best' planning solutions, which could then simply be implemented afterwards (Interviewee B3). This is of course impossible but suggests expectation management will be required when introducing new tools of techniques like serious gaming to support participatory planning.

Also, it is important to realise that simply having stakeholders play one serious game session, is insufficient to effectuate a lasting change of behaviour and planning practices. Indeed, in the six cities under investigation, the game had helped bring about a discussion on tourism development and had increased players' appreciation and understanding of the complexities involved with sustainable urban tourism, but this has not resulted in actual changes on the ground. It is not very surprising that a one-off game session has insufficient impact to set in motion changes in governance or planning. Still, this does reflect a weakness of the current singular intervention. Embedding design-based serious gaming within a wider programme or process that includes a series of interventions, be it 'ordinary' workshops, digital planning tools or other forms of engagement may help overcome this problem.

Theoretical implications

The game addresses certain issues that hinder the kind of transformative policymaking that is often advocated for in the literature, but has proven difficult to implement in practice (Dredge, 2006; Higgins-Desbiolles et al., 2019; Ren, Duim, & Jóhannesson, 2017; Saarinen & Gill, 2018). In particular, the game was useful to point out the complexity of tourism planning, with players initially struggling, but later very much appreciating the multifaced game-design. The game also stimulated a more holistic and integrative approach to tourism planning. It stimulated multi-level interdisciplinary governance, as different stakeholders worked together to continuously mobilise others, build wider coalitions and experiment with alternative solutions (Kemp et al., 2007).

To get across a long-term perspective proved more difficult. Players focused on solving topical problems in the city or improving on the elements that the digital game dashboard highlighted. Issues like climate change, where impacts are not directly visible, were mostly ignored. Whilst this does appear to accurately represent current policy perspectives (Aall & Koens, 2019), it suggests another type of activity or approach may be required that focuses on such elements. It also highlights the theoretical importance to remain aware of the process of participatory planning and the strategic goals or outcome that the process seeks to facilitate. Failure to do so, can mean that participants may have had an enjoyable time, with lively discussions, but subsequently struggle to act on the insights that were gained, as it does not fit with the strategic agenda of their organisation or city (Mayer, 2009).

A related, but more serious issue, which is commonly discussed in the literature on participatory planning, is ensuring inclusiveness and preventing marginalization or disempowerment of certain groups (Devos et al., 2018). Within the development of the game, the importance of this was considered. The game was deliberately designed to provide an arena of interaction that is relatively safe and open, with gameplay emphasis on "shared understanding, and a transparency of process, in which the basis and rationale of decision making is understood rather than imposed" and in which a facilitator seeks to minimize power distortions (Bond & Thompson-Fawcett, 2007, p. 452). Game design cannot help overcome broader issues related to the political formation of participatory planning though, such as whom to invite to participate, or (not) having clear and transparent policies on how to follow up on participation sessions (Bond & Thompson-Fawcett, 2007; Legacy, 2017). To an extent, this weakness could be observed in Belgrade, where outcomes were hindered by the fact that most players were students rather than real-life stakeholders. Given that serious gaming may become more popular when tourism rebuilds itself after the Covid-19 pandemic, it cannot be stressed enough that it is merely a tool. Its use does not automatically lead to inclusive participatory planning and, if used incorrectly, may even be counterproductive.

The findings of this paper are also useful in light of the difficulties researchers have in overcoming the gap between (academic) research and implementation by policymakers and industry (Cohen et al., 2016). Publishing in academic journals, the most common way of academic

knowledge dissemination, has long proved to be rather inefficient for bringing about change, as academic journals are rarely read and even more rarely acted upon by practitioners. Even when researchers reach out to get the message across in a more accessible way (e.g. by means of a specific advisory report, poster or presentation), the onus to act remains on individual practitioners, which rarely happens in an industry where everybody is fully absorbed by tomorrow's occupancy rates and margins (Melissen et al., 2016). The outcomes of this paper suggest that design-based serious gaming could assist academics in contributing to furthering such perspectives, also among stakeholders who are not (yet) inclined to engage with systemic change. The format of a serious game means that practitioner stakeholders are confronted with insights from academia in a more playful and engaging way, in contrast to the traditional academic outputs.

Developing serious games is a time-consuming process though and means that academics would have to be less inward looking than currently is the case (McKercher & Prideaux, 2014). It requires a willingness and the skills to engage with other disciplines and practitioners, while accepting that the current academic system might not be ready to judge this type of contribution on its merit (Melissen & Koens, 2016). A full discussion of *this* systemic change is beyond the scope of this paper. However, surely, those of us engaged with sustainable tourism research care enough about the true end goal of a sustainable society, to not allow us to be fully absorbed by the short-term benefits of playing the academic game.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This work is part of the research programme JPI Urban Europe – ERA-NET Cofund Smart Cities and Communities with project number 5619886, which is (partly) financed by the Netherlands Organisation for Scientific Research (NWO).

ORCID

Ko Koens  <http://orcid.org/0000-0002-2803-0098>
 Jessika Weber-Sabil  <http://orcid.org/0000-0001-6245-4911>
 Frans Melissen  <http://orcid.org/0000-0002-8211-5957>
 Lidija Lalicic  <http://orcid.org/0000-0002-8846-1762>
 Igor Mayer  <http://orcid.org/0000-0002-5592-8848>
 Irem Önder  <http://orcid.org/0000-0001-7020-3733>
 Carlo Aall  <http://orcid.org/0000-0002-4798-4612>

References

- Aall, C. (2014). Sustainable tourism in practice: Promoting or perverting the quest for a sustainable development? *Sustainability*, 6 (5), 2562–2583. <https://doi.org/10.3390/su6052562>
- Aall, C., & Koens, K. (2019). The discourse on sustainable urban tourism: The need for discussing more than over-tourism. *Sustainability*, 11(15), 4228. <https://doi.org/10.3390/su11154228>
- Ashworth, G., & Page, S. J. (2011). Urban tourism research: Recent progress and current paradoxes. *Tourism Management*, 32 (1), 1–15. <https://doi.org/10.1016/j.tourman.2010.02.002>
- Boom, S., Weijsschede, J., Melissen, F., & Mayer, I. (2020). Identifying stakeholder perspectives and worldviews on sustainable urban tourism development using a Q-sort methodology. *Current Issues in Tourism*. <https://doi.org/10.1080/13683500.2020.1722076>.
- Bond, S., & Thompson-Fawcett, M. (2007). Public participation and new urbanism: A conflicting agenda? *Planning Theory & Practice*, 8(4), 449–472.

- Bramwell, B., & Lane, B. (Eds.). (2000). *Tourism collaboration and partnerships: Politics, practice, and sustainability*. Channel View Publications.
- Butler, R. (1980). The concept of a tourist area cycle of evolution: Implications for management of resources. *The Canadian Geographer/Le Géographe Canadien*, 24(1), 5–12. <https://doi.org/10.1111/j.1541-0064.1980.tb00970.x>
- Cohen, S. A., Higham, J., Gössling, S., Peeters, P., & Eijelaar, E. (2016). Finding effective pathways to sustainable mobility: Bridging the science-policy gap. *Journal of Sustainable Tourism*, 24 (3), 317–334. <https://doi.org/10.1080/09669582.2015.1136637>
- Cohen, S. A., & Hopkins, D. (2019). Autonomous vehicles and the future of urban tourism. *Annals of Tourism Research*, 74, 33–42. <https://doi.org/10.1016/j.annals.2018.10.009>
- Crookall, D. (2010). Serious games, debriefing, and simulation/gaming as a discipline. *Simulation & Gaming*, 41 (6), 898–920.
- Cross, N. (2011). *Design thinking: Understanding how designers think and work*. Berg Publishers.
- Devos, T., De Blust, S., & Desmet, M. (2018). Valuating narrative accounts in participatory planning processes. In O. Devisch, L. Huybrechts, & R. D. Ridder (Eds.), *Participatory design theory: Using technology and social media to foster civic engagement*. Routledge.
- Dragouni, M., Fouseki, K., & Georgantzis, N. (2018). Community participation in heritage tourism planning: Is it too much to ask? *Journal of Sustainable Tourism*, 26(5), 759–781. <https://doi.org/10.1080/09669582.2017.1404606>
- Dredge, D., & Jamal, T. (2015). Progress in tourism planning and policy: A post-structural perspective on knowledge production. *Tourism Management*, 51, 285–297. <https://doi.org/10.1016/j.tourman.2015.06.002>
- Dredge, D. (2006). Networks, conflict and collaborative communities. *Journal of Sustainable Tourism*, 14 (6), 562–581. <https://doi.org/10.2167/jost567.0>
- Edwards, D., Griffin, T., & Hayllar, B. (2008). Urban tourism research: Developing an agenda. *Annals of Tourism Research*, 35(4), 1032–1052. <https://doi.org/10.1016/j.annals.2008.09.002>
- Fletcher, R., Mas, I. M., Blanco-Romero, A., & Blázquez-Salom, M. (2019). Tourism and degrowth: An emerging agenda for research and praxis. *Journal of Sustainable Tourism*, 27(12), 1745–1763. <https://doi.org/10.1080/09669582.2019.1679822>
- Gemeente Amsterdam. (2018). *Stad in Balans 2018-2022; Naar een nieuw evenwicht tussen leefbaarheid en gastvrijheid*. Gemeente Amsterdam.
- Gössling, S., Scott, D., & Hall, C. M. (2020). Pandemics, tourism and global change: A rapid assessment of COVID-19. *Journal of Sustainable Tourism*, 1–20. <https://doi.org/10.1080/09669582.2020.1758708>
- Greene, J. C. (2008). Is mixed methods social inquiry a distinctive methodology? *Journal of Mixed Methods Research*, 2(1), 7–22. <https://doi.org/10.1177/1558689807309969>
- Gugerell, K., & Zuidema, C. (2017). Gaming for the energy transition. Experimenting and learning in co-designing a serious game prototype. *Journal of Cleaner Production*, 169, 105–116. <https://doi.org/10.1016/j.jclepro.2017.04.142>
- Hall, C. M. (2010). Changing paradigms and global change: From sustainable to steady-state tourism. *Tourism Recreation Research*, 35(2), 131–143. <https://doi.org/10.1080/02508281.2010.11081629>
- Healey, P. (2006). *Urban complexity and spatial strategies: Towards a relational planning for our times*. Routledge.
- Higgins-Desbiolles, F., Carnicelli, S., Krolkowski, C., Wijesinghe, G., & Boluk, K. (2019). Degrowing tourism: Rethinking tourism. *Journal of Sustainable Tourism*, 27(12), 1926–1944.
- Høyer, K. G. (2000). Sustainable tourism—or sustainable mobility? *Journal of Sustainable Tourism*, 8(2), 147–161. <https://doi.org/10.1080/09669582.2019.1601732>
- Innerhofer, E., Fontanari, M. & Pechlaner, H. (Eds.). (2018). *Destination resilience : Challenges and opportunities for destination management and governance*. Routledge.
- Jansen-Verbeke, M. (1992). Urban recreation and tourism: Physical planning issues. *Tourism Recreation Research*, 17 (2), 33–45. <https://doi.org/10.1080/02508281.1992.11014648>
- Keijser, X., Ripken, M., Mayer, I., Warmelink, H., Abspoel, L., Fairgrieve, R., & Paris, C. (2018). Stakeholder engagement in maritime spatial planning: The efficacy of a serious game approach. *Water*, 10(6), 724. p. <https://doi.org/10.3390/w10060724>
- Kemp, R., Loorbach, D., & Rotmans, J. (2007). Transition management as a model for managing processes of co-evolution towards sustainable development. *The International Journal of Sustainable Development & World Ecology*, 14 (1), 78–91.
- Koens, K., Melissen, F., Mayer, I., & Aall, C. (2019). The smart city hospitality framework: A conceptual framework for collaborative reflections on tourism's contribution to a transition towards sustainable urban development. *Journal of Destination Marketing & Management*, 100376. <https://doi.org/10.1016/j.jdmm.2019.100376>
- Koens, K., Postma, A., & Papp, B. (2018). Is overtourism overused? Understanding the impact of tourism in a city context. *Sustainability*, 10 (12), 4384. <https://doi.org/10.3390/su10124384>
- Koens, K., Postma, A., & Papp, B. (2019). Management strategies for overtourism – from adaptation to system change. In H. Pechlaner, E. Innerhofer, & G. Erschbamer (Eds.). *Overtourism, tourism management and solutions*. Routledge.
- Lalicic, L., & Weber-Sabil, J. (2019). Stakeholder engagement in sustainable tourism planning through serious gaming. *Tourism Geographies*, 1–21. <https://doi.org/10.1080/14616688.2019.1648543>

- Legacy, C. (2017). Is there a crisis of participatory planning? *Planning Theory*, 16(4), 425–442. <https://doi.org/10.1177/1473095216667433>
- Mansilla, J. A., & Milano, C. (2018). *Ciudad de vacaciones: Conflictos urbanos en espacios turísticos*. Pol-len Edicions.
- Marzuki, A., Hay, I., & James, J. (2012). Public participation shortcomings in tourism planning: The case of the Langkawi Islands, Malaysia. *Journal of Sustainable Tourism*, 20(4), 585–602. <https://doi.org/10.1080/09669582.2011.638384>
- Mayer, I. S. (2009). The gaming of policy and the politics of gaming: A review. *Simulation & Gaming*, 40 (6), 825–862.
- Mayer, I., Bekebrede, G., Hartevelde, C., Warmelink, H., Zhou, Q., Ruijven, T., van Lo, J., Kortmann, R., & Wenzler, I. (2014). The research and evaluation of serious games: Toward a comprehensive methodology. *British Journal of Educational Technology*, 45 (3), 502–527. <https://doi.org/10.1111/bjet.12067>
- McCool, S. F., & Lime, D. W. (2001). Tourism carrying capacity: Tempting fantasy or useful reality? *Journal of Sustainable Tourism*, 9 (5), 372–388. <https://doi.org/10.1080/09669580108667409>
- McKercher, B., & Prideaux, B. (2014). Academic myths of tourism. *Annals of Tourism Research*, 46, 16–28. <https://doi.org/10.1016/j.annals.2014.02.003>
- Meadows, D. H., & Robinson, J. M. (2002). The electronic oracle: Computer models and social decisions. *System Dynamics Review*, 18 (2), 271–308. <https://doi.org/10.1002/sdr.239>
- Melissen, F., & Koens, K. (2016). Adding researchers' behaviour to the research agenda: Bridging the science–policy gap in sustainable tourism mobility. *Journal of Sustainable Tourism*, 24 (3), 335–349. <https://doi.org/10.1080/09669582.2015.1071384>
- Melissen, F., Koens, K., Brinkman, M., & Smit, B. (2016). Sustainable development in the accommodation sector: A social dilemma perspective. *Tourism Management Perspectives*, 20, 141–150. <https://doi.org/10.1016/j.tmp.2016.07.008>
- Mendoza, G. A., & Prabhu, R. (2005). Combining participatory modelling and multi-criteria analysis for community-based forest management. *Forest Ecology and Management*, 207 (1–2), 145–156. <https://doi.org/10.1016/j.foreco.2004.10.024>
- Milano, C., Novelli, M., & Cheer, J. M. (2019). Overtourism and degrowth: A social movements perspective. *Journal of Sustainable Tourism*, 27 (12), 1857–1875.
- Mirowski, P. (2002). *Machine dreams: Economics becomes a cyborg science*. Cambridge University Press.
- Nunkoo, R. (2015). Tourism development and trust in local government. *Tourism Management*, 46, 623–634. <https://doi.org/10.1016/j.tourman.2014.08.016>
- Pasquinelli, C., & Trunfio, M. (2020). Reframing urban overtourism through the Smart-City Lens. *Cities*, 102, 102729. <https://doi.org/10.1016/j.cities.2020.102729>
- Peeters, P. M., Daalen, E., & Tiemersma, S. (2014, July 2). *The science-policy gap and how to close it with dynamic serious games*. In A. for Tourism (Trans.), *The Psychology of Governing Tourism Mobility*, 2nd International Workshop in the Black Forrest.
- Peeters, P., & Schouten, F. (2006). Reducing the ecological footprint of inbound tourism and transport to amsterdam. *Journal of Sustainable Tourism*, 14 (2), 157–171. <https://doi.org/10.1080/09669580508669050>
- Peters, V., Vissers, G., & Heijne, G. (1998). The validity of games. *Simulation & Gaming*, 29 (1), 20–30.
- Phi, G. T., & Dredge, D. (2019). Collaborative tourism-making: An interdisciplinary review of co-creation and a future research agenda. *Tourism Recreation Research*, 44(3), 284–299. <https://doi.org/10.1080/02508281.2019.1640491>
- Pruitt, J., & Grudin, J. (2003). Personas: Practice and theory. In *Proceedings of the 2003 conference on designing for user experiences - DUX '03* (p. 1). ACM Press.
- Ren, C., Duim, R. van der, & Jóhannesson, G. T. (Eds.). (2017). *Co-Creating Tourism Research; Towards Collaborative Ways of Knowing*. Routledge. <https://doi.org/10.4324/9781315393223-1>.
- Romero-García, L. E., Aguilar-Gallegos, N., Morales-Matamoros, O., Badillo-Piña, I., & Tejeida-Padilla, R. (2019). Urban tourism: A systems approach – state of the art. *Tourism Review*, 74 (3), 679–693. <https://doi.org/10.1108/TR-06-2018-0085>
- Romme, A. G. L. (2003). Making a difference: Organization as design. *Organization Science*, 14 (5), 558–573. <https://doi.org/10.1287/orsc.14.5.558.16769>
- Rosner, S., & Abt, L. E. (Eds.). (1970). *The Creative Experience*. Penguin Adult HC/TR.
- Saarinén, J., & Gill, A. M. (Eds.). (2018). *Resilient destinations and tourism: Governance strategies in the transition towards sustainability in tourism* (1 ed.). Routledge.
- Schön, D. (1983). *The reflective practitioner how professionals think in action*. Basic Books.
- Smeenk, W., Sturm, J., & Eggen, B. (2019). A comparison of existing frameworks leading to an empathic formation compass for co-design. *International Journal of Design*, 13(3), 16.
- Smit, B., & Melissen, F. (2018). *Sustainable customer experience design: Co-creating experiences in events, tourism and hospitality* (1 ed.). Routledge.
- Stake, R. E. (2013). *Multiple case study analysis*. Guilford Press.
- Stomppff, G. (2012). *Facilitating team cognition: How designers mirror what NPD teams do* [PhD Thesis]. Technical University of Delft.

- Suttie, N., Louchart, S., Lim, T., Macvean, A., Westera, W., Brown, D., & Djaouti, D. (2012). Introducing the “Serious Games Mechanics” a theoretical framework to analyse relationships between “Game” and Pedagogical aspects” of serious games. *Procedia Computer Science*, 15, 314–315. <https://doi.org/10.1016/j.procs.2012.10.091>
- Timur, S., & Getz, D. (2009). Sustainable tourism development: How do destination stakeholders perceive sustainable urban tourism? *Sustainable Development*, 17(4), 220–232. <https://doi.org/10.1002/sd.384>
- Urioste-Stone, S. D., McLaughlin, W. J., Daigle, J. J., & Fefer, J. P. (2018). Applying case study methodology to tourism research. In R. Nunkoo (Ed.), *Handbook of research methods for tourism and hospitality management* (pp. 407–427). Edward Elgar Publishing. <https://doi.org/10.4337/9781785366284>
- Webb, R., Bai, X., Smith, M. S., Costanza, R., Griggs, D., Moglia, M., Neuman, M., Newman, P., Newton, P., Norman, B., Ryan, C., Schandl, H., Steffen, W., Tapper, N., & Thomson, G. (2018). Sustainable urban systems: Co-design and framing for transformation. *Ambio*, 47(1), 57–77. <https://doi.org/10.1007/s13280-017-0934-6>
- Weber-Sabil, J., Lalicic, L., Buijtenweg, T., Hutchinson, K., Santos, C., Melissen, F., Koens, K., & Mayer, I. (2019, August 30). *Managing competing values in sustainable urban tourism: A simulation-gaming approach* [Paper presentation]. Simulation & gaming through times and across disciplines. 50th Anniversary ISAGA conference, Warsaw.

Appendix 1. Participants of game sessions in each city

Person	Gender	Type of work	Directly in tourism
Amsterdam 1	Male	Private Sector	-
Amsterdam 2	Female	Public Sector	yes
Amsterdam 3	Female	Private Sector	yes
Amsterdam 4	Female	Public Sector	yes
Amsterdam 5	Female	Public Sector	no
Amsterdam 6	Female	Public Sector	yes
Amsterdam 7	Female	NGO/nonprofit sector	yes
Amsterdam 8	Female	Public Sector	-
Amsterdam 9	Male	Private Sector	no
Amsterdam 10	Female	Private Sector	no
Belgrade 1	Female	Student	no
Belgrade 2	Female	Student	no
Belgrade 3	Female	Public Sector	no
Belgrade 4	Male	Student	no
Belgrade 5	Male	Public Sector	yes
Belgrade 6	Male	Public Sector	yes
Belgrade 7	Female	Student	no
Belgrade 8	Female	Student	no
Belgrade 9	Male	Private Sector	yes
Belgrade 10	Male	Student	no
Belgrade 11	Female	Student	no
Belgrade 12	Male	Public Sector	yes
Belgrade 13	Female	Student	no
Belgrade 14	Female	Student	no
Belgrade 15	Female	Public Sector	yes
Belgrade 16	Male	Student	yes
Belgrade 17	Female	Student	no
Darmstadt 1	Female	Public Sector	yes
Darmstadt 2	Female	Public Sector, NGO/nonprofit sector	
Darmstadt 3	Female	Public Sector	no
Darmstadt 4	Female	Private Sector	-
Darmstadt 5	Male	Public Sector	yes
Darmstadt 6	Female	Public Sector, Private Sector	-
Darmstadt 7	Male	NGO/nonprofit sector	yes
Darmstadt 8	Male	Public Sector	no
Darmstadt 9	Male	Public Sector, Private Sector	no
Darmstadt 10	Female	Public Sector	-
Darmstadt 11	Female	Public Sector, Private Sector	-
Darmstadt 12	Male	-	no
Darmstadt 13	-	-	-
Darmstadt 14	Female	NGO/nonprofit sector	no
Gothenburg 1	Male	Public Sector	no
Gothenburg 2	Female	Public Sector	no
Gothenburg 3	Female	Public Sector	no

(continued)

Continued.

Person	Gender	Type of work	Directly in tourism
Göteborg 4	Female	Public Sector	no
Göteborg 5	Male	Public Sector	yes
Göteborg 6	Female	Public Sector	no
Göteborg 7	Male	Public Sector	no
Göteborg 8	Male	Public Sector	no
Göteborg 9	Female	Public Sector	no
Göteborg 10	Male	Public Sector	-
Göteborg 11	Male	Private Sector, Public Sector	yes
Göteborg 13	Female	Public Sector	-
Stavanger 1	Male	Private Sector	yes
Stavanger 2	Female	Public Sector	no
Stavanger 3	Female	-	no
Stavanger 4	Male	Public Sector	-
Stavanger 5	Female	NGO/nonprofit sector	-
Stavanger 6	Female	NGO/nonprofit sector	no
Stavanger 7	Female	Other	no
Stavanger 8	Female	-	yes
Stavanger 9	Female	-	no
Valencia 1	Male	Private Sector	yes
Valencia 2	Female	NGO/nonprofit sector	no
Valencia 3	Male	Private Sector	no
Valencia 4	Male	Private Sector	no
Valencia 5	Female	Private Sector	no
Valencia 6	Male	Private Sector	yes
Valencia 7	Female	Private Sector, NGO/nonprofit sector	no
Valencia 8	Male	Private Sector	no
Valencia 9	Female	Public Sector, Private Sector	yes
Valencia 10	Male	Public Sector	no
Valencia 11	Male	Other	no