Maritime Spatial Planning – A Board Game for Stakeholder Involvement

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Abstract. The Maritime Spatial Planning (MSP) Challenge game: Short Sea Shipping (SSS) Edition is a table-top strategy board game, designed for policy-makers and stakeholders involved in MSP, short-sea shipping and the Blue Economy. It is a 'serious game', allowing the development of a better understanding of the issues involved in MSP through creative and imaginative role playing, taking into account the relevant professional and personal experience of the players. The authors present and discuss the use of the MSP Challenge board game to test how, and to what extent, the concept can help stakeholders understand Maritime Spatial Planning.

Keywords: Maritime Spatial Planning · Stakeholder involvement
Serious gaming · Board game · Short sea shipping · Blue Growth

1 Introduction

European countries have relied on access to seas and oceans for their economic and social development for many centuries [1]. As a result, these areas have experienced increased pressures, both in terms of space and uses made of the marine environment. Many different activities take place at sea; ranging from shipping, fisheries, oil and gas extraction, to offshore wind energy and military activities. As increased use is made of offshore marine resources, the requirement becomes greater for countries to work more effectively together if those resources are to be utilised sustainably. Simultaneously, new and evolving policies focus on tools to integrate different marine demands in space and resources [2].

Uncoordinated planning and management of marine space can result in underperformance of the (blue) economy and/or the overexploitation of resources (e.g. marine

ecosystem goods and services) [3]. Marine or Maritime Spatial Planning (MSP) is defined as "a process of public authorities of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic and social objective" [4]. Further, MSP is described as "optimizing sea use and ensuring the integrity of the ecosystem at the same time" [5]. MSP has been developed in response to these current challenges and is still a rather new governmental approach in most parts of Europe [6].

MSP has been introduced in different countries [7] and can be considered a much needed approach to manage and organize the use of the sea and oceans. Stakeholder participation and involvement is an important factor to the success of MSP [8]; and has furthermore been identified as being key to MSP [9]. Stakeholder involvement and cross-border cooperation provide opportunities to deepen mutual understanding about MSP issues, explore and integrate ideas and generate new options and solutions [8]. However, according to Pomeroy and Douvere (2008), stakeholder participation alone is not enough. Stakeholders need to be (and feel) empowered to enable their full engagement [8].

Collaborative tools, such as serious gaming/simulation gaming (SG), can be used to facilitate stakeholder engagement and, in turn, to gather evidence about the human-level processes involved. This improves the available body of literature and, thereby, increases trust in scientific evidence [10]. According to Morf et al. (2013), there is a need of personal experience and interactive practice in MSP, as planning can hardly be taught and learned individually or by books [11].

As a result, the MSP Challenge: Short Sea Shipping (SSS) Edition board game has been developed. It is designed to let stakeholders experience some of the dynamic and complex interactions in ecosystem-based MSP in relation to short sea shipping and Blue Growth and to start 'thinking and talking' about the interrelations among different sea uses and objectives.

This paper discusses 'How and to what extent the MSP Challenge: Short Sea Shipping board game can help stakeholders understand MSP?' First, we describe the main design characteristics of the MSP Challenge SSS board game. We continue the discussion to consider 'To what extent can MSP professionals broaden and improve their understanding of MSP following gameplay?' Finally, we address the question of 'To what extent do individual and professional backgrounds and perspectives influence participants' general understanding of MSP as a result of gameplay?'

2   MSP Challenge Board Games

The MSP Challenge: Short Sea Shipping (SSS) edition was developed for a high level meeting on short sea shipping in Amsterdam on 15 February 2016, held as part of the NL Presidency of the EU Council [12]. It is an adaptation into board game form of the electronic simulation game 'Maritime Spatial Planning Challenge 2050' [10, 13]. Following the success of the Short Sea Shipping edition, other versions of the MSP Challenge board game have been developed [13–15] for different groups of stakeholders concentrating on different aspects of, and contexts for, maritime spatial planning. In this paper we do not make a significant distinction between these games. More

information about the different versions and design decisions can be found on www. mspchallenge.info [13].

The MSP Challenge SSS is a 'table top strategy board game' designed for policy-makers and stakeholders with an interest in the field of MSP [12, 13]. The game is designed to run for between one to three hours, depending on the setting, involving twelve to thirty players.

The goal is to let players experience some of the dynamic and complex interactions between Short Sea Shipping and Maritime Spatial Planning (MSP). The main challenge for the players is to achieve Blue Growth (BG) and Good Environmental Status (GES) in their national and shared marine waters through the spatial allocation of economic functions and ecological features and the development of short sea shipping [12, 14, 15].

The game is played in the fictional sea basin called the 'Rica Sea' (see Fig. 1), which gives players a level playing field. The Rica Sea is shared by three countries: Bayland, Peninsuland and Island. These countries have their own maritime heritage and ideas about the future development of the Rica Sea. The map shows various parameters, such as cities/ports and water depths; important information for maritime spatial planners [12, 14, 15].
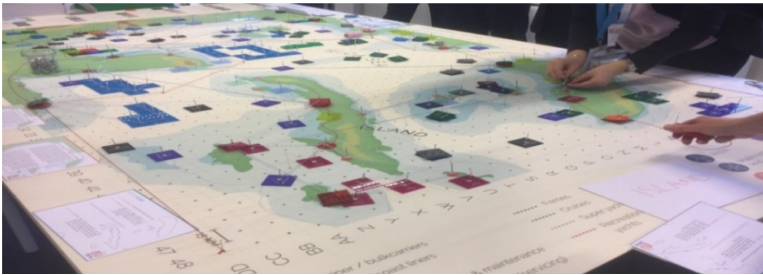

Fig. 1. Impression of the MSP Challenge board game in use with tokens to illustrate different marine activities in the Rica Sea.

In each country, players assume the roles of Maritime Spatial Planners, Nature Conservationists or a representative of a marine-related industry, such as Shipping, Fisheries, (Renewable) Energy or Tourism & Recreation. The players receive some background information about the Rica Sea and policy objectives per country. Furthermore, players will receive 'opportunity maps' at some point during the game-play. These maps give the '*best available scientific evidence*' which hint at opportunities and threats for achieving a blue economy [12, 14, 15].

At the start of the game, the game board is set up by the facilitators and shows a few 'opportunity areas' such as ports, cultural sites, wrecks, bird areas, etc. However, most of the sea area is still undeveloped; it is up to the players to further develop the 'Rica Sea' taking into account the countries' national policy objectives and wider international objectives, like achieving BG and GES. This is done by placing various tokens and threads on the game board [12, 14, 15].

These tokens and threads, symbolize all kinds of human activities (e.g. energy, fisheries), ecological functions (e.g. bird and habitat areas) and shipping (e.g. cargo, ferries). There are 25–40 different tokens and 5–10 different coloured threads. The number of different tokens and threads, and combination in which they are placed on the board, is up to the players. During the game, the players may gradually find out that they get into each other's way and this should players start 'thinking and talking' about the interrelations among the different objectives [12, 14, 15].

The game is facilitated by a moderator and a Game Overall Director (G.O.D.). The G.O.D., a policy expert, has the authority to give additional information, decide or intervene in all matters that are unclear or not provided for in the game. At the start of the game, the moderator briefly explains the rules and objectives of the game. At chosen intervals, the moderator pauses the game in order to facilitate a discussion on some key observations. The G.O.D. plays an important role in the game, giving or asking feedback and explanation from the real MSP world. After the game, the moderator explains key concepts and practices of MSP processes and an evaluation takes place with the players on successes and apparent inconsistencies in developing a Blue Economy for the 'Rica Sea' [12, 14, 15].

3   Method

Our empirical research strategy has thus far been mostly quantitative in nature, using questionnaires to obtain information on participants' level of MSP understanding and its possible influential factors after each session. The questionnaires were intentionally brief (2 pages) as the gameplay is already demanding. The questionnaire consisted of background questions (demographics, sector of employment, pre-existing MSP involvement, perspective on sustainability) and statements (scale: 1 = strongly disagree; 5 = strongly agree) on game play experience (general perceived usability and playability of the game), and MSP appreciation and understanding. We included one open question for comments and feedback, and we noted our general observations as facilitators and observers of the sessions.

In this paper we analyze data from the following gameplay sessions:

- Session in Millport (3 h), Scotland on 15 October 2016 - 9 respondents (all but one female; all working in the UK, with one originating from Ecuador)
- Session at Baltic MSP Forum in Riga (1 h), Latvia on 24 November 2016 - 13 respondents (7 female; 5 male; originating from and working in several different European countries)
- Session at North Sea Days in Scheveningen (1 h), the Netherlands on 6 October 2016 - 22 respondents (14 male; 8 female; all but one originating from the Netherlands, all but two working in the Netherlands)
- Session with two game boards at Atlantic Strategy Stakeholder Conference in Dublin (1 h), Ireland on 26 September 2016 - 32 respondents (16 male; 15 female; mostly originating from and working in Ireland and the UK).

Of the 76 respondents in total, 36 (47%) were male and 38 (50%) were female. Most respondents (50%) worked in the non-profit sector (e.g. science and academia,

NGOs), followed by those who worked in the public sector (36.5%; e.g. government, public administration, public policy advice). A final 12.2% worked in the private sector (e.g. fishing, shipping, tourism, energy). Given the limited set of data, all further statistical analyses are non-parametric (Figs. 2 and 3).
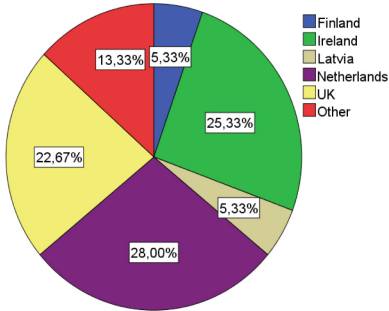

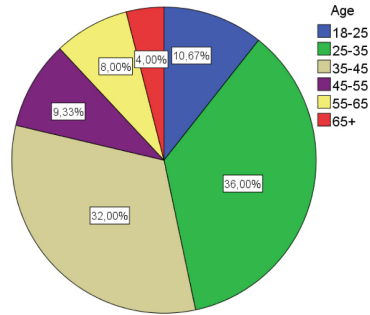**Fig. 2.** Distribution of countries of employment.

Fig. 3. Distribution of age of participants.

We conducted various descriptive, reliability and correlation analyses to answer our research questions. We were able to calculate and work with two components: a component representing five statements on overall game experience assessment (usability, playability, enjoyment) and a component representing four statements on overall MSP understanding. These and other ordinal and scale variables were not normally distributed. Thus we were mindful to conduct only non-parametric analyses.

4   Results

Table 1 shows that, in general, respondents scored positively on our measures of MSP understanding.

Table 1. Obtaining a general understanding of MSP – key descriptives

Measure	Mean $\pm$ SD	Min–Max	Median	Mode
'I know better what MSP is.' ($N = 75$)	3.73 $\pm$ 1.03	1–5	4	4
'I can better imagine the different viewpoints on MSP.' ($N = 73$)	3.96 $\pm$ 0.95	1–5	4	4
'I gained more insight into what the important factors in MSP are and how they (can) influence each other.' ($N = 74$)	3.77 $\pm$ 0.87	1–5	4	4
'I gained insights on how different planning scales (local, regional, national, international. etc.) can influence decisions made.' ($N = 74$)	3.53 $\pm$ 1.06	1–5	4	4
General understanding of MSP ($N = 72$; Cronbach's Alpha: .835)	3.76 $\pm$ 0.80	1.75–5.00	4.00	N/A

The overall component, derived from all four statements, indicates a positive overall response, though not highly positive. Additionally, roughly one-fifth of the respondents provided insightful remarks pertaining to their understanding of MSP. Seven respondents remarked critical aspects and common challenges of MSP, thereby indicating that they better understand MSP itself. For example:

- 'Really interesting and innovative way [for] getting people to think about the different interests and viewpoints of the various stakeholders.'
- 'The game shows clearly how governance and communication links work in reality. Everyone undermines the planners and mind[s] their own interest.'
- 'Nice to see how you experience that you first go for your own interests, then national, and only then international in this game. Actually isn't good, but this is how it worked. Also: everyone wants to plan as much as possible.'

Another eight respondents provided remarks that signaled a lack of understanding of MSP characteristics and issues, mostly because they attributed their experience to flaws in game design and facilitation rather than the collective play and MSP itself. For example:

- 'In terms of set up players tend to [remain] in the space in front of them, and not move around the table.
- 'Personally would have benefited from more information about tokens e.g. requirements for building of wind power, transport options for oil + gas, etc.'
- 'Clearer game rules and objectives, and consequences of actions would make the game clearer and more fun … The chaos would then get less, I think (without consequences nobody feels responsible).'

4.1 Factors Influencing MSP Understanding

Gameplay Experience

Table 2 shows that overall respondents assessed the gameplay experience positively. Kendall's tau and Spearman's rho tests revealed significant, though rather limited, positive correlations between the gameplay experience assessment component and MSP understanding (respectively .227, $p = .012$ and .304, $p = .011$).

Table 2. General gameplay experience assessment – key descriptives.

Measure	Mean ± SD	Min–Max	Median	Mode
'I think it is easy to learn how to play the game.' (N = 74)	3.86 ± 0.80	1–5	4	4
'I think the information provided in the game is clear.' (N = 75)	3.56 ± 0.81	1–5	4	4
'I feel creative while playing the game.' (N = 75)	4.00 ± 0.85	2–5	4	4
'I think the game is fun.' (N = 75)	4.48 ± 0.58	3–5	5	5
'I enjoy playing the game.' (N = 73)	4.40 ± 0.66	3–5	4	5
Gameplay experience assessment (N = 72; Cronbach's Alpha: .691)	4.06 ± 0.50	2.80–5.00	4.20	N/A

Kruskal-Wallis tests revealed statistically significant differences between the four gameplay sessions on both gameplay experience assessment ($p = .024$) and MSP understanding ($p = .000$). Further Kruskal-Wallis tests also revealed significant differences between the different countries of origin ($p = .000$) and employment ($p = .028$) on MSP understanding. The distributions on gameplay experience assessment and MSP understanding for each are shown in the boxplots below (Figs. 4 and 5).
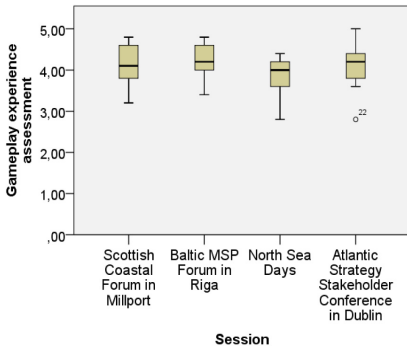

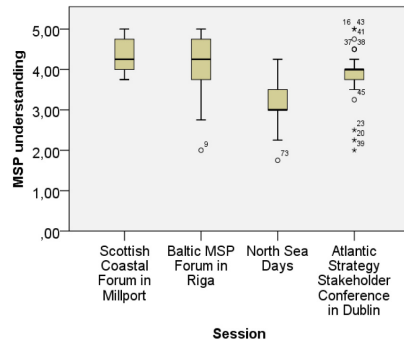**Fig. 4.** Distribution of gameplay experience assessment per session.

Fig. 5. Distribution of MSP understanding per session.

Employment Sector

Another Kruskal-Wallis test revealed statistically significant differences ($p = .008$) between sectors of employment on the distribution of MSP understanding. The distributions on MSP understanding for each category are shown in the table below (Fig. 6).
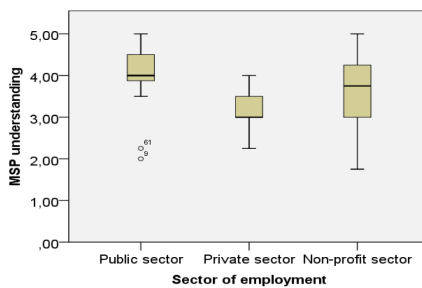

Fig. 6. Distribution of MSP understanding per sector of employment

Sustainability Perspective

Table 3 shows how we measured two different perspectives on sustainability - 'soft' vs. 'hard' – with a significant though rather limited negative correlation between the two (Spearman's rho: $-.334$, $p = .005$; Kendall's tau: $-.294$, $p = .005$).

Table 3. Sustainability perspectives – key descriptives.

Statement	Mean ± SD	Min–Max	Median	Mode
'Depletions in natural resources and decline of biodiversity can be compensated for through economic growth and improvements in technology.' ('soft' sustainability; $N = 71$)	2.55 ± 1.32	1–5	2	1
'Human activity and economic development should not be allowed to undermine natural systems and processes that are vital to the existence of humans.' ('hard' sustainability; $N = 71$)	4.42 ± 0.77	2–5	5	5

Twenty-one respondents (29.6%) at least slightly agreed with the 'soft' sustainability statement. Kruskal-Wallis, Spearman's rho and Kendall's tau tests revealed only a significant correlation between 'soft' sustainability perspective and MSP understanding (respectively $p = .010$; .353, $p = .003$; .289, $p = .002$).

5   Discussion and Conclusion

From our data analyses we conclude that, in general, MSP stakeholders from any sector and background can enjoy and appreciate the experience of a 'serious game' on Maritime Spatial Planning (MSP). Whether they understand MSP better afterwards depends not only on key session characteristics (such as quality of facilitation, number of participants, timing, scenarios and the gameplay itself), but also on key characteristics of the participant's own professional background, notably their perspective on sustainability and sector of employment. Participants from public and non-profit sectors and those with a 'soft' sustainability perspective seem to be more open towards MSP. Cultural differences in organization and communication might have an influence on the game play and its effect on MSP understanding, but our data is inconclusive in this respect.

Although our data shows a positive relationship between participation and understanding of MSP, we cannot conclude that gaming is more effective than other, more conventional means such as presentations or publications. Further studies could be conducted in a quasi-experimental manner to determine this. Other future research could also focus on the role of gaming in the MSP process itself; to what extent does gaming influence actual MSP processes and outcomes?

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