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Riskville - A Game for Learning about Disaster Risks and Urban Planning

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Education plays a key role in disaster risk reduction (DRR) and in creating resilient societies worldwide by disseminating information about risks and in improving people's risk awareness. This, in turn, helps them to prepare, cope with and recover from possible disaster events, hence making the societies more resilient. This paper shortly presents the theoretical background and the rules of the game Riskville where the participants get to experience in a hands-on manner the connections and conflicts between urban planning, different interests and climate related risks. We conclude that Riskville promotes discussions on different perspectives on disaster risk and resilience and approaches in including them into urban planning.

Keywords: Risk, urban planning, higher education, disaster risk reduction, resilience.

Riskville - A Game for Learning about Disaster Risks and Urban Planning

The role of education in disaster risk reduction (DRR) and in creating resilient societies worldwide is emphasized by many researchers (e.g. Aksit et al. 2017; Christensen 2009; Johansson et al. 2013; UNISDR 2015a). Education plays a key role in disseminating information about risks and in improving people's risk awareness. This, in turn, helps them to prepare, cope with and recover from possible disaster events, hence making the societies more resilient (Johansson et al. 2013; UNISDR 2015a). It is through education that learners can be subject to the responsibility of reacting to challenging social issues in connection to risks, which is linked to responsible citizenship (Oyao et al. 2015).

Games as educational tools in higher education can help the students gain important skills, such as communication, resourcefulness and adaptability (Barr 2018). The Centre for Climate and Safety at Karlstad University has developed a variety of games dealing with management of climate related risks, which can be used for educational and communicative purposes for different target groups. One such game is *Riskville*, where the overall objective is to visualise and let players experience connections and conflicts between urban planning, different interests and climate related risks. The game aims to raise awareness of the impacts of climate related risks on local society and ways to mitigate effects of climate related risks by including a resilience approach in urban planning. The game also promotes discussions and learning not only from an individual perspective but also from interaction and experiences from peers - all of which are significant factors in facilitating learning (Barr 2018; Schusler, Decker, and Pfeffer 2003).

THEORETICAL BACKGROUND

Global agreements under the post-2015 development agenda emphasise the role of education. For example, the Sendai Framework for Disaster Risk Reduction 2015-2030 (UNISDR 2015a) stresses the importance of incorporating knowledge of DRR in formal and non-formal education, in civic education at all levels, as well as in professional education and training (UNISDR 2015a). In similar vein, the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDG) emphasise the role of education for sustainable development and highlights the importance of skills and knowledge for finding solutions to social and environmental challenges to achieve sustainable development (UN 2015).

In recent years, risk, resilience and sustainability have gained more attention in urban planning, in part because of the aforementioned frameworks and also because of different international calls and campaigns, such as the UNISDR's "Making Cities Resilient". The concept of resilience in particular, defined here as "the ability to prepare and plan for, absorb, recover from, and more successfully adapt to adverse events" (The National Academies 2012:1), has been lifted up as a central concept in successful urban planning

(Johnson and Blackburn 2014). Urban planning is a challenging task that needs to take into account, and often mediate between, many different interests. While perspectives of risk, resilience and sustainability are of utmost importance; they are sometimes posed as opposing to other perspectives such as continued growth, attractively or economic development (Arrow et al. 1995).

Disaster risk, as defined by UNISDR (2015b), is understood as "the consequence of the interaction between a hazard and the characteristics that make people and places vulnerable and exposed". Vulnerability, as defined by Wisner et al. (2004, p. 11), is understood as "the characteristics of a person or a group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard." Risk is not a neutral or objective measure of the likelihood of crisis or disaster, but a normative construction, invested with values and beliefs (Olofsson et al. 2014). Risk communication is often seen as an important part of DRR, both between the different authorities but also from authorities to public, since it has a key role in improving citizens' risk awareness. The authorities' ability to manage and communicate risks plays a big role in how the public perceives risks and the measures taken to reduce future risks (Hellman 2015; van Niekerk and Wisner 2013). But it is less clear what information should get transmitted, how, why and to whom (Demeritt and Nobert 2014).

Learning is a key component in the understanding and management of risks, both after disastrous events and in preventing and mitigating future events as part of a risk management system (Rydstedt Nyman 2016). One challenge with learning from disaster events is that they occur at specific time and place. Education is a way to disseminate knowledge, experiences and "lessons learned" from previous disaster events to a wider audience, from one region to another and from the past to present. Yet, disaster risks are "anchored in time- and context-dependent beliefs about society and its inhabitants, which influence both how society is organized and governed and how we as individuals live our lives" (Giritli Nygren, Öhman, and Olofsson 2017:10; see also UNICEF 2012). Since both hazards and vulnerabilities are subject to change, risks need to be continuously assessed and the given education needs to adapt to these changes. Understanding risks and having a capacity to avoid or prepare for risks relate to citizenship and democracy since a democratic society depends on its citizen's ability to make informed decisions and choices, being able to motivate these choices, respecting others choices and being able to participate in discussions (ten Dam and Volman 2004). Hence, learning about risks and disasters is relevant at different levels of society, for decision-makers and experts, as well as citizens.

PLAYING RISKVILLE

Since 2013, when the first version of *Riskville* was developed, the game has been used by and adapted to different target groups. A large number of school children, university students, researchers and representatives of society and government have played the game over the years. At Karlstad University it has been used in numerous courses, both with undergraduate and postgraduate students from a variety of disciplines, including human geography, teacher education, risk management and risk- and environmental studies. Thematic orientation is flexible and the focus has been on environmental issues; generic spatial planning; personal safety issues; and climate related risks including flash floods and elevated water levels.

In the game *Riskville* participants get to experience in a hands-on manner how vulnerabilities to certain risks are tightly connected to urban planning. Participants act as planners and implementers of various processes, taking into account the opinions of interest groups and citizens in the growing town. The game aims to raise participants' awareness of the multi-faceted nature of urban planning and how choices made early in the game might have unexpected and unwanted consequences later on, when hazardous events occur.

Riskville is made of simple pieces representing different buildings, infrastructure, water bodies or other geographical features in and around the town. The pieces can easily be made of any available material and altered based on the features one wants to have in the game. In the simple version (as shown in picture 1), a green felt carpet act as the board with waterways represented by blue fabric. Holiday houses, villas, apartment-houses and various pieces of critical and non-critical infrastructure are represented by painted wooden blocks, whereas roads, parking lots and railways are represented by paper strips. Flooded areas, for example, can be marked with pieces of blue paper. Timewise a typical game takes between 30-45 minutes.

In a typical game of *Riskville*, students are divided into two or more groups with 3-4 participants per group. One of the participants (either a student or a teacher) is assigned as a game master with the task to guide the groups through the game scenario using a prepared script consisting of numbered game cards. The game master hands out various assignments to the groups during the game. A detailed description of how to adopt the game of Riskville as well as game cards can be found at (https://www.kau.se/en/ccs/cooperation-and-collaboration/risklab/riskville).

Picture 1. Geography Students Playing *Riskville*.

A game session includes three phases. In the first phase players focus on planning an attractive town. The groups are given assignments with different focus, and time to discuss what characterizes an attractive town and to build it accordingly. The assignments can be such as:

> "There are many empty buildings in one of the city's industrial areas. Choose an industrial area, tear down the existing buildings, clean up the land and then build housing for the growing population."

> "The old hospital is too small for the growing city and more hospital beds are needed. Your task is either to reconstruct the old hospital or to build a new one in a different location."

The groups will discuss and agree on actions, make the factual changes on the game board and then motivate their actions to the other groups. Keeping in mind the overall goal of attractiveness, the players tend to build residential areas close to water, separate industrial and residential areas, and cluster community services and commercial areas with good accessibility.

In the second phase the assignments are broader. The players are asked to make optional changes to make the town more resilient and sustainable. The groups explain their actions to each other and then discuss alternative solutions, as well as different interests and goals in urban planning, such as growth, accessibility and safety.

Once the groups have made the changes, a game changer is introduced. Participants are given a challenge driven by a climate related event, such as heavy rain, which floods certain areas of the town. The groups' task is first to discuss the consequences and impacts of the

event for the town and its inhabitants, and secondly to assess and mark the affected locations, structures and functions. Game changers can be varied depending on prior knowledge levels and experience of participants, and can for example be:

> "After an unusually snowy winter the water level in the river running through the town rise, and as a consequence low-lying areas close to the river are flooded. Viaducts and the areas around bridges are flooded and traffic must be rerouted. The situation lasts for about one week."

The last phase tends to lead to intense discussions highlighting the need to shift focus from attractiveness to risks and resilience. Players are usually able to identify multiple risks and often conclude that building close to water can pose a major threat.

Excerpt from the third phase of a game played with geography students:

Game master. -What precautions could be taken to prevent this damages in the future, or at least mitigate the effects of the flooding?
Student 1. -Perhaps one should not build too close to the water.
Student 2. -Exactly!
Student 1. -Build on a higher altitude or try to level up the underwork. Like by the library which is just next…
Student 2. -Here we need embankments or something. (points).
Student 3. -Yes, something that (shows a rising motion with gestures)
Student 2. -Here we also have the risk of erosion, just by the river.

To sum up the game, the game master leads a joint discussion about the consequences and impacts of the game changer: how could the impacts be reduced or altogether prevented in future, and what role does risk management play in urban planning? Specific themes, such as safe/unsafe buildings and structures, vulnerable groups, and capacity development can be highlighted.

DISCUSSION AND CONCLUSION

The game of *Riskville* presents an excellent opportunity to present and discuss the intersection between urban planning and risk management in an interactive and playful manner. *Riskville* is flexible in its settings and the goals of the game can be varied depending of the players previous experiences. Hence, *Riskville* can be used in education on various levels, both for school children, higher education students as well as policy makers and the public.

Regardless of age or prior experiences, the game will force the players to face dilemmas concerning conflicting interests and values related to planning an attractive community and

managing risks, all with varying degrees of uncertainty. In the face of these dilemmas, the game creates a platform for discussing issues that can otherwise be difficult to identify, understand and contextualize. By creating this platform, the game can be an important step in an effort to learn and communicate about risks, urban planning and decision-making as well as how they all relate to each other. The game helps to raise awareness about flood related problems by way of seeing, feeling and experiencing, while allowing learning not only from the game itself but also from the interaction, experiences and perspectives of the other students (Schusler et al. 2003; Barr 2018). Playing the game with students in higher education, and students of risk science in particular, opens a window not only for discussing broader concepts of risk and urban planning, but also for discussing theoretical concepts and perspectives regarding DRR, sustainable development, vulnerability, capacity, resilience, etc. Based on our experience in using the game in higher education it is clear that *Riskville* promotes communication, the ability to discuss, reach common decisions and practice to construct and justify arguments.

While the game does not feature people at risk in a direct manner (no game pieces representing people), it is still possible to imagine that people are what the game is ultimately about. Are decisions about disaster risk the sole responsibility of society and its authorities? Can and should the people at risk have a say in these processes? Besides making decisions about the placement of buildings, dams, and pump stations, what measures are available and suitable to increase the capacity and preparedness of the people at risk? How do these processes relate to concepts of resilience and sustainable development? These questions and many more are open to discussion from playing the game. As mentioned earlier, the frames of the game are loose enough to allow people of all ages to play and discuss from whatever vantage point they peer out. It is easy to alter to different settings and to simulate different scenarios and to build from available materials. Some teachers have, for example, taken the idea and used it in their work in school. While the game takes approximately 30 minutes to play, it helps players formulate, discuss and reflect upon a plethora of questions. In the end the game can constitute a small cog in the great clock of learning, which ultimately is part of the foundation for striving toward a resilient society.

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