

# Experiential Learning and Visualization in Group Model Building Workshops for Sustainable Environments

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## Extended Abstract

### 1. Introduction

Group model building (GMB) workshops are structured activities designed to capture the insights of stakeholders about a given issue. These insights, rooted in stakeholders' experiences, reflect their 'mental models,' which are the individual frameworks to understand and interact with the world around them. By tapping into these personal viewpoints on systems complexity, GMB workshops help to develop formal models of the explored problem, enhancing the participants' mental model about the complex problems with systems thinking.

Learning about systems thinking is critical for moving towards a resilient, healthy and sustainable environment because it supports stakeholders navigate through the complexity of environmental challenges, facilitating the development of adaptive, cross-boundary solutions for long-term resilience and sustainability (Eker & Ilmola-Sheppard, 2020; Voulvoulis et al., 2022). The process of learning systems thinking, as emphasized by Sterman (1994), involves double feedback loops: firstly, decision-makers generate information from real-world interactions, make decisions, and subsequently refine their actions to bring the system closer to its goals. Secondly, new information reshapes decision-maker's mental models, prompting individuals to adapt their decision-making rules and strategies accordingly.

The design of GMB workshops, therefore, demands careful consideration and selection of activities that effectively elicit and refine mental models through practical, hands-on experiences. However, the prevalent design of GMB workshops often overlooks the diverse array of learning styles. Learning styles are defined as how individuals perceive facts and patterns and develop thinking around them (Kolb & Goldman, 1973). Kolb and Goldman (1973) and Kolb's (1984) work on learning styles has been commonly used in education, behavioural sciences, social sciences and technology studies (Chen et al., 2005; Frantz et al., 2017). Other research into learning styles includes Keefe's (1991) work in psychology, which defines it as the combination of cognitive, affective, and physiological behaviours serving as indicators of how individuals perceive, interact, and respond to their learning environment.

However, the traditional methods used to extract these mental models in GMB workshops often overlook the styles of cycles of how individuals learn, which are the preferred ways individuals process and internalize information in their mental models. While some literature in systems thinking has acknowledged the importance of incorporating learning cycles and styles into teaching system dynamics, such consideration has not been accounted for within GMB workshops.

## **2. Research questions and plans**

This paper reflects on the idea of learning about systems thinking. It is situated in an intersected field of learning cycles and systems thinking, with a particular emphasis on how the 'experiential learning framework'—a learning theory that defines learning as a process whereby learning is generated and grounded through the experience—can be applied to enhance understanding and learning generation within these workshops.

Our research question is: How do we better design GMB workshops to integrate experiential learning and leverage visualization tools to elicit concrete experience?

We propose ideas for incorporating the learning cycles into GMB activities, thereby refining the systems learning process and promoting more effective systems thinking for a healthy and sustainable environment.

In the video, we outline our theoretical approaches, share initial reflections, and discuss our plans for moving forward:

**YouTube Video:** <https://youtu.be/2rAJcJYfJUQ>