

# DialogueMaps

A web-based tool for supporting interactive dialogues in education, research, and consulting

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**Abstract**—This paper outlines the theoretical backgrounds, the requirements for and the technical realization of DialogueMaps, a web-based tool for supporting interactive dialogues in education, research, and consulting. A first evaluation has already been conducted. An outlook is given on future directions of development.

*Keywords*-interactive dialog; web-based; knowledge maps

## I. INTRODUCTION AND MOTIVATION

In many learning contexts, participants are involved in interactive dialogues to bring together their individual knowledge. Such situations may occur in education as well as in research and consulting. Based on several theoretical concepts we developed a web-based tool (called DialogueMaps) for supporting the creation of knowledge maps in interactive dialogues.

## II. THEORETICAL UNDERPINNINGS AND REQUIREMENTS

The development of DialogueMaps (DM) is based on several theoretical underpinnings, namely: Theory of discourses and dialogs [1], Neurath's research on icons and ISOTYPE [2], the Mikropolis Model [3], Knowledge Maps [4,5,6], Graphic Recording [7], Computer Supported Cooperative Learning (CSCL) [8], Issue Based Information System (IBIS) [9], and DialogueMapping [10].

For a tool to supporting interactive dialogues, the following requirements can be derived from the concepts of the theoretical approaches listed above: The tool should support the communication process within a group; it should use Neurath's ideas and provide icons to visualize the ideas being discussed. It should consider transdisciplinary and interdisciplinary dialogues with a low entry barrier and by putting great emphasis on the degrees of freedom during the creation of a map. Furthermore, the tool should support the creation of complex knowledge maps by means of navigation like zooming, panning, and adding links to further material to the map. While graphic recording is mainly done by professional illustrators, the tool should provide icons, which are easy to understand. The tool should be easy to use, so that it may be used by technically or artistically less skilled people.

The basic ideas of CSCL lead to the requirement of involving participants by the means of hard- and software. Students may use DM to actively create building blocks of

knowledge. Teachers, researchers or consultants may provide an initial map which gets enriched with further details during the dialogue. The tool should be independent from the underlying hardware and compatible with interactive boards and mobile devices. The latter may be used for the synchronous creation of maps by several participants on mobile devices.

As we have learned from the literature, the need for supporting interactive dialogues exists in education as well as in research and consulting [1,4-10]. While it may be used in education for gathering participants' knowledge within a seminar, interdisciplinary or transdisciplinary research can especially profit from visualizing complex situations that are being discussed by a group of researchers. Consultants may use the tool for analyzing situations in their clients' environment. The clients' staff is encouraged to participate, as the tool is easy to learn and use; a proper selection of icons is provided for different contexts and methods.

## III. RESEARCH APPROACH AND RESULTS

The research project is design science oriented [11] and uses prototyping [12] and agile development (scrum) [13] as a methodological guide. DM was developed as a web-based tool on the basis of Java, Apache Tomcat, and Wicket (server-side). The client side uses HTML5, Javascript (incl. jQuery), and an SVG canvas. Communication between client and server and persistence is provided by JSON objects, Ajax, Hibernate, and MySQL. Compared to other tools (like prezi.com), DM is solely based on open source components and does not use any proprietary software like Flash.

So far, DM has been used and evaluated in the context of education at a university. For the future, we plan to use and evaluate DM also in inter- and transdisciplinary research dialogues and in consulting.

## IV. CONCLUSION AND OUTLOOK

As we have argued based on several theoretical underpinnings, a tool that meets the requirements listed above may provide useful support for interactive dialogues in different contexts. So far, we have developed and evaluated a prototype. Our current efforts aim at providing synchronous work on a single map with different devices, freehand drawing on the SVG canvas and the support of multi-touch gestures.

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