

## Serendipitous Learning and Interdisciplinarity (Poster)

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### Abstract

Web 2.0 tools and emerging technologies offer an abundance of connections, resources, and different pathways to information. Linking different interdisciplinary information and allowing various degrees of relevance and connection has the potential to generate new knowledge from interconnected information sources (Hahmann & Burghardt, 2010). Information retrieval is based on the premise that users already have some knowledge about the information they seek. However, people also encounter and make useful insights regarding information that was not specifically sought, that is, acquiring information in an accidental, incidental, or serendipitous manner (Toms, 2000). Thus, being immersed in the world of hypertext resources and interlinked information can bring unexpected and unplanned learning discoveries that might bring about meaningful learning.

We sought to explore the potential of serendipitous learning and perception of knowledge structure in a game-based setting by analyzing the log files of the NaraView game. NaraView is a social game that connects Wikipedia definitions and hypertext thus turning databases into playgrounds. Players have to get from one Wikipedia page (the origin) to another (the destination), only by clicking "wikilinks" (internal Wikipedia links) on the pages encountered. In this playground of hypertext resources and interlinked information, serendipitous discoveries might occur. In this process, the encounter with incidental irrelevant information can transform into relevant information, in which learning is the by-product of the interaction. Furthermore, interdisciplinary learning outcomes contribute to a personalized integration and assimilation of knowledge (Ivanitskaya, Clark, Montgomery & Primeau, 2002). Thus, the greater the "distance" between the origin and the destination in the game, the greater the potential for meaningful learning interaction.

The original log file included 312,522 rows documenting 8,074 games. After cleansing and pre-processing it, there were left 1,417 games and an overall of 8,660 unique pages. A graph describing each game consists of vertices (Wikipedia pages which the players traversed/visited) and edges (each refer to a move from one page to another). To operationalize the *distance between pages* in each game, we calculated the shortest path for successfully completing the game (the greater this value is, the greater the distance). We also calculated for each vertex its degree (normalized by the graph size), then took the average and the max of these values, as a proxy for the variety of different paths in the game (the greater these values are, the greater the number of different paths). This is a proxy for the *potential for serendipitous*

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*learning*. We find that the distance between the origin and the destination is negatively correlated with the level of variety of paths in the game. That is, more opportunities for serendipitous learning and exploring the perception of knowledge structure are enabled when discussing two concepts that are relatively distant from each other.

**Keywords:** Interdisciplinary, serendipitous learning, Wikipedia, log files.

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