VISUAL ANALYTICS IN MEDICAL EDUCATION

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D1.1 KEYNOTE LECTURES

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The big data present in the medical curriculum that informs undergraduate medical education is beyond human abilities to perceive and analyze. The medical curriculum is the main tool used by teachers and directors to plan, design, and deliver teaching and assessment activities and student evaluations in medical education in a continuous effort to improve it. Big data remains largely unexploited for medical education improvement purposes. The emerging research field of visual analytics has the advantage of combining data analysis and manipulation techniques, information and knowledge representation, and human cognitive strength to perceive and recognize visual patterns. Nevertheless, there is a lack of research on the use and benefits of visual analytics in medical education.

The present study is based on analyzing the data in the medical curriculum of an undergraduate medical program as it concerns teaching activities, assessment methods, and learning outcomes in order to explore visual analytics as a tool for finding ways of representing big data from undergraduate medical education for improvement purposes. Cytoscape software was employed to build networks of the identified aspects and visualize them.

After the analysis of the curriculum data, eleven aspects were identified. Further analysis and visualization of the identified aspects with Cytoscape resulted in building an abstract model of the examined data that presented three different approaches; (i) learning outcomes and teaching methods, (ii) examination and learning outcomes, and (iii) teaching methods, learning outcomes, examination results, and gap analysis.

This study identified aspects of medical curriculum that play an important role in how medical education is conducted. The implementation of visual analytics revealed three novel ways of representing big data in the undergraduate medical education context. It appears to be a useful tool to explore such data with possible future implications on healthcare education. It also opens a new direction in medical education informatics research.