

Gemeinsame Jahrestagung der Gesellschaft für Medizinische Ausbildung (GMA), des Arbeitskreises zur Weiterentwicklung der Lehre in der Zahnmedizin (AKWLZ) und der Chirurgischen Arbeitsgemeinschaft Lehre (CAL)

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Meeting Abstract

Cognitive load of team-based learning in radiology education

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Text

For many years educational scientists critique the effectiveness of lectures for attaining the learning objectives set for higher education [1]. But even at medical schools that already adopted competency based curricula, lectures are still the dominant teaching format. It seems hard to 'beat' its obvious instructional efficiency.

Team based learning integrating individual activities, small-group work and class-wide activities has the potential to address active, constructive and interactive cognitive engagement with a similar efficiency [2]. However such complex pedagogical scenarios involve many factors that compete for working memory capacity. An important question for the effectiveness of these innovative scenarios is therefore if all involved factors leave sufficient working memory to learn.

A radiology course for undergraduate medical students (n=143) was transformed from a series of lectures into one single 'radiology day'. The scenario involved:


- multiple small-groups each supervised by a radiologist all located in the same computer landscape
- a radiologist who moderated class-wide discussions
- clinical cases with marker- and other types of questions on 2D and 3D radiologic images in a computer program
- a 'learning dashboard' for each small-group that showed how group members performed in the individual computer tasks (figure 1 [Fig. 1]).

Based on a general method for instrument development [3], a questionnaire was developed with eighteen items addressing: task, teacher, learning technology and physical environment in cognitive load dimensions. Each item employed a 0-10 scale. Five items addressed intrinsic, four germane and nine extraneous load.

The technological functionalities that managed the scenario made it possible to run the activities successfully and in time. The means for each type of cognitive load were: intrinsic 7.4, germane 6.4 and extraneous load 2.9. Within the intrinsic load dimension the perceived mental effort for discussing findings in the small group was less than for the other items (mean 4.9). Within the extraneous load dimension students reported the most distraction from the physical environment (premises, noise).

Integrated pedagogical scenarios that combine individual computer work with 'learning dashboard' supported small-group and plenary discussions can both be effective and efficient in undergraduate radiology education.

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