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A revision of design-based learning

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Teaching and learning science through design activities

A revision of design-based learning

Dave H.J. van Breukelen

1. It is in the nature of design-based learning to face students with complex and multidimensional learning environments that force students to focus on what to do and deliver rather than what to learn. (*this thesis*)
2. Student-centred learning environments, where teachers have to relinquish directive control, are making demands on teacher competences over and above teacher-centred learning environments. (*this thesis*)
3. The level of concept learning through design activities strongly depends on explicit teaching and scaffolding strategies. (*this thesis*)
4. Design-based research is the preferable approach to investigate dynamic, authentic learning environments and to generate related educational insights, where collaboration between practitioners, researchers and educational leaders and experts is indispensable to its success. (*this thesis*)
5. The implementation and dissemination of student-centred learning environments, to improve and modernise education, requires inductive teacher training methods.
6. A strong emphasis on content knowledge, driven by ready-to-use knowledge-based textbooks and final exams, lowers teachers' creativity and students' motivation and is detrimental to learning skills and practices.
7. School boards should stimulate, facilitate and partly obligate teachers to collaborate and to improve their educational practice by taking social developments into account.
8. STEM literacy and skills deserve the same high-level attention that has recently been given to language development and numeracy.
9. The way technology tries to meet human needs will provide insight into how (design-based) research has to meet educational needs.
10. Getting a doctorate feels like deciding to buy and enjoy an expensive bottle of fine whiskey. It takes guts and a lot of exploration and decision making but finally it is the thrill of a lifetime and over soon.