

T2_53 ILLUSTRATION AND ANIMATION IN MULTIMEDIA - FINDING POSSIBILITIES AND CRITICAL FACTORS FOR EXPLAINING PLANCK'S LAW AND INFRARED RADIATION

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The statement that learners benefit from animated visuals can not be generalized. Different effects were found in several studies (e.g. Mayer, R. E. & Moreno, R. (2002); Betrancourt & Tversky, 2000). Using pictures and illustrations meet similar problems. However, one interesting appliance is, to use pictures and animations to illustrate phenomena that are not visible with naked eyes. Accessorily multimedia makes them interactive and allows combinations of different kinds of visualizations also with acoustic information. Extending a former study (Girwitz, 2004) different kinds of illustrations are categorized and their possibilities for learning are specified. Aspects from theories of multimedia learning will be discussed to connect practical aspects with theory of learning. Especially the supplantation principle (Vogel, Girwitz & Engel 2007) will be used to connect abstract graphs with illustrations and pictures. The presentation focus on visuals that are used to explain, how infrared motion detectors and infrared thermometers work, as well as to make Planck's law and infrared radiation more familiar. Illustrated graphs, animations and thermal imaging are employed and their information value will be discussed. Also results from a study with students will be presented. References Betrancourt, M. & Tversky, B. (2000). Effect of computer animation on users' performance: A review. *Travail Humain*, 63(4), 311-329. Girwitz, R. (2004). Illustrations and Animated Visual Presentations. In: E. Mechlová (Ed.), *Teaching and Learning Physics in new Contexts. GIREP 2004 proceedings*. Ostrava: University of Ostrava. pp. 221-222. Mayer, R. E. & Moreno, R. (2002). Animation as an Aid to Multimedia Learning. *Educational Psychology Review*, Vol. 14, No.1, March 2002, 87-99. Vogel, M., Girwitz, R., & Engel, J. (2007). Supplantation of Mental Operations on Graphs. *Computers & Education* 49 (2007), pp. 1287-1298.