T1_78 DISCOVERING ELECTROMAGNETIC INDUCTION: INTERACTIVE MULTIMEDIA PATH

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Typical educational paths on electromagnetic induction go thoroughly though step-by-step explanations: "- What happens if we insert the north pole into the solenoid? – And what if we insert the south pole?". Using multimedia is even more boring: students find difficult the visualisation of the coil windings directions and the current on a 2-D representation [1]. The crucial question on the direction of the current induced is not the "right" or "left" hand rule (as by the way was already discussed in the funny form by Italian excellent nuclear physicist Bruno Touschek), but the energy conservation law. This is the very basic law, and the principle of Faraday-Lenz von Neumann is the direct consequence. To bring students to this observation we organize an interactive path using elements of MOSEM and TPiSS Projects [2]. The "hook", i.e. the attention catching experiment is the drunken magnet, drawing a snake-like trajectory on the inclined copper plane. Then we show a well-known experiment with a magnet falling inside a copper tube [3] but we do not fix the attention on the time of falling but on the observation of the magnet inside. We insist on the verbalisation of the experiment by pupils. "-What is the best expression for the movement of the magnet inside the tube?". "It is slowed down", "-Really?", "It does not touch the walls", "-Really?", "It levitates", "- Yes! This is the best expression!" "- What is the reason for the levitation?" "A repulsive force". "- So you understand that sometimes the copper plane attracts the moving magnet, sometimes it repels. We can call it the Faraday – Lenz – von Neumann principle". Then, we leave students with several experiments to fix better the ideas, comprised experiments with the computer and the readout of the voltage generated inside the coil wound around a tube [5]. In the paper we will show the experiments and their multimedia mirror [5].

[1] http://online.supercomet.no, Elect. induction, 4/21 and 5/21. [2] http://www.mosem.no , http://mosem.fizyka.umk.pl [3] M. Michelini, SUPERCOMET 2, Teacher guide, p. 62. [4] M. Gervasio, Saggio finale, SSIS Udine, 2008 [5] http://mosem.fizyka.umk.pl , Multimedia.