

Presentation of the paper “Smart Textile objects and conductible ink as a context for arts based teaching and learning of computational thinking at primary school”

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Abstract

This is the presentation of the paper entitled “Smart Textile objects and conductible ink as a context for arts based teaching and learning of computational thinking at primary school” in the Computational Thinking session of the TEEM 2016 International Conference held in Salamanca (Spain) in November 2-4, 2016.

The shaping of Smart Textile artefacts brings together a variety of learning activities, such as imagining, designing, drawing, constructing, wiring, programming, controlling, testing, debugging and presenting self-made, invented media objects, realized in project- and team based arrangements. A variety of human senses are addressed when pupils develop and sketch their project ideas to be realized. In the paper, we discuss the topic of self-made Smart Textile objects as a learning content for primary school level, towards the development of curriculum modules for project learning in the classroom as well as teacher training. It was developed in the ‘Teachers Aids on Creating Contents for Learning Environments’ TACCLE3 coding project.

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Keywords

Smart textile; wearables; tangible media; art and design based learning; physical computing; contextualized learning; cross-disciplinary learning; TACCLE 3 - Coding.

References

- [1] Amici software blog of the Eduwear project: <http://dimeb.informatik.uni-bremen.de/eduwear/>
- [2] Arduino LilyPad Website <http://lilypadarduino.org/>
- [3] Buechley, L. 2012. Script of the TED talk. How to sketch with electronics. available at https://www.ted.com/talks/leah_buechley_how_to_sketch_with_electronics/transcript?language=en#t-14430
- [4] Dimeb Web site: http://dimeb.informatik.uni-bremen.de/eduwear/wpcomponent/uploads/2010/11/EduwearKit_manual_nov_2010_de.pdf [August 2015]
- [5] García-Peñalvo, F.J., 2016. A brief introduction to TACCLE 3 – Coding European Project. In 2016 International Symposium on Computers in Education (SIIE) IEEE, USA.
- [6] Kafai et al 2010. Fröbel's forgotten gift: Textile Construction Kits as Pathways into Play, Design and Computation, online text available at: http://kpeppler.com/Docs/2010_Peppler_Forgotten_Gift.pdf
- [7] Kafai, Burke (2014). Connected code. Why children need to learn programming. Cambridge, Ma: The MIT press.
- [8] Manovich, L. Software takes command. New York. Bloomsbury Academic, 2013. Online version November 20, 2008. http://softwarestudies.com/softbook/manovich_softbook_11_20_2008.pdf
- [9] Reimann et al. 2003. Exploring the Computer as a Shapeable Medium by Designing Artefacts for Mixed Reality Environments in Interdisciplinary Education Processes, in: Proceedings of the ED-MEDIA, World Conference on Educational Multimedia, Hypermedia and Telecommunications 2003, Honolulu, 2003, p. 915-923
- [10] Reimann, D. 2006. Ästhetisch-informatische Medienbildung mit Kindern und Jugendlichen. Oberhausen
- [11] Reimann, D. 2011. Shaping Interactive Media with the Sewing Machine. Smart Textile as an Artistic Context to Engage Girls in Technology and Engineering Education, in: Mura, G. (Ed.). International Journal of Art, Culture and Design Technologies (IJACDT), ISSUE ON CREATIVITY, INNOVATION AND TECHNOLOGIES CULTURES, 2011, p. 12-21
- [12] Reimann, D. 2015. Smart Textile as a Creative Environment To Engage Girls In Technology, in: Mura, G. (ed. 2015): "Analyzing Art, Culture, and Design in the Digital Age", <http://www.igi-global.com/>
- [13] Reimann, D. and Maday, C., 2016. Smart Textile objects and conductible ink as a context for arts based teaching and learning of computational thinking at primary school. In *Proceedings of the Fourth International Conference on Technological Ecosystems for Enhancing Multiculturality (TEEM'16) (Salamanca, Spain, November 2-4, 2016)*, F.J. García-Peñalvo Ed. ACM, New York, NY, USA, 31-35. DOI=<http://dx.doi.org/10.1145/3012430.3012493>.
- [14] Rosales, A. Wearable music. Creating sound effects and music by playing. 2012. Project presented at Ars Electronica 2012, u19-createyour world village, festival catalogue. Prix Ars Electronica. Berlin. Stuttgart
- [15] TACCLE3 consortium, 2016. TACCLE3. Coding Erasmus+-project Website. <http://www.taccle3.eu>
- [16] Tan, X.L. Storytelling wearables, an alternative biography. 2005 www.xiaolitan.com/thesis/thesis.html [19.2.2010] and http://we-make-money-not-art.com/xiao_li_tans_st/ [12.04.2016]
- [17] The International Society for Technology in Education (ISTE) and The Computer Science Teachers Association (CSTA)(ed.) Operational Definition of Computational Thinking for K–12 Education, The national Science Foundation 2011 online at CSTA=<https://csta.acm.org/Curriculum/sub/CurrFiles/CompThinkingFlyer.pdf>
- [18] Trappe, C. Creative access to technology. Building Sounding Artifact with children. 2012. In. proceedings of IDC 2012, Bremen, short paper