

# Catalog of Publications per Type of Research

## Open-Source Hardware in Education: a Systematic Mapping Study

January 11, 2018

---

### EvaluationResearch

---

- [1] L. Buechley, M. Eisenberg, and N. Elumeze. Towards a curriculum for electronic textiles in the high school classroom. *SIGCSE Bulletin*, 39(3):28-32, June 2007.
- [2] J. R. Byrne, L. Fisher, and B. Tangney. Computer science teacher reactions towards raspberry pi continuing professional development (cpd) workshops using the bridge21 model. In *2015 10th International Conference on Computer Science Education (ICCSE)*, pages 267-272, July 2015.
- [3] D. Kyuchukova, G. Hristov, P. Zahariev, and S. Borisov. A study on the possibility to use raspberry pi as a console server for remote access to devices in virtual learning environments. In *2015 International Conference on Information Technology Based Higher Education and Training (ITHET)*, pages 1-4, June 2015.
- [4] B. Li, J. Mooring, S. Blanchard, A. Johri, M. Leko, and K. Cameron. Seemore: A kinetic parallel computer sculpture for educating broad audiences on parallel computation. *Journal of Parallel and Distributed Computing*, 105:183-199, 2017.
- [5] M. Virnes. Robotics in special needs education. In *7th International Conference on Interaction Design and Children*, IDC '08, pages 29-32, New York, NY, USA, 2008. ACM.

---

## ExperiencePaper

---

- [6] N. Arora, N. Agarwal, and S. R. N. Reddy. Funpi: An interactive learning experience using story narration. In *Proceedings of the Sixth International Conference on Computer and Communication Technology 2015, ICCCT '15*, pages 398–402, New York, NY, USA, 2015. ACM.
- [7] T. Baden, A. M. Chagas, G. Gage, T. Marzullo, L. L. Prieto-Godino, and T. Euler. Open Labware: 3-D Printing Your Own Lab Equipment. *PLOS Biology*, 13(5):1–12, 2015.
- [8] E. Barba and S. Chancellor. Tangible media approaches to introductory computer science. In *Proceedings of the 2015 ACM Conference on Innovation and Technology in Computer Science Education, ITiCSE '15*, pages 207–212, New York, NY, USA, 2015. ACM.
- [9] L. Buechley and M. Eisenberg. Boda blocks: A collaborative tool for exploring tangible three-dimensional cellular automata. In *8th International Conference on Computer Supported Collaborative Learning, CSCL'07*, pages 102–104. International Society of the Learning Sciences, 2007.
- [10] L. Buechley, M. Eisenberg, J. Catchen, and A. Crockett. The lilypad arduino: Using computational textiles to investigate engagement, aesthetics, and diversity in computer science education. In *SIGCHI Conference on Human Factors in Computing Systems, CHI '08*, pages 423–432, New York, NY, USA, 2008. ACM.
- [11] R. Chacon and S. Oller. Designing experiments using digital fabrication in structural dynamics. *Journal of Professional Issues in Engineering Education and Practice*, 143(3), 2017.
- [12] W. Dams, M. Roggemans, P. Pelgrims, T. Tierens, and D. Pauwels. Open hardware platform helps students getting started in analog and digital design. In *IEEE International Conference on Microelectronic Systems Education (MSE'07)*, pages 133–134, June 2007.
- [13] P. Di Giamberardino and M. Temperini. Adaptive access to robotic learning experiences in a remote laboratory setting. pages 565–570, 2017.
- [14] J. Fritz, M. Matthews, T. Wulf, J. Scott, and J. Fritz. University of cincinnati and saint ursula academy partnership: Introducing female high school students to the field of information technology, year 2. In *Proceedings of the 17th Annual Conference on Information Technology Education, SIGITE '16*, pages 109–109, New York, NY, USA, 2016. ACM.

- [15] C. Gonzalez, I. Alvarado, and D. Peřija. Low cost two-wheels self-balancing robot for control education. *IFAC-PapersOnLine*, 50(1):9174–9179, 2017.
- [16] I. Ivan, C. Petit, I. Gurgu, and R. Toscano. Afm nanıfıye ıfı development of an education oriented high resolution profilometer. *IFAC-PapersOnLine*, 50(1):2385–2390, 2017.
- [17] S. Kurkovsky and C. Williams. Raspberry pi as a platform for the internet of things projects: Experiences and lessons. volume Part F128680, pages 64–69, 2017.
- [18] A. Merkouris and K. Chorianopoulos. Introducing computer programming to children through robotic and wearable devices. In *Proceedings of the Workshop in Primary and Secondary Computing Education*, WiPSCE '15, pages 69–72, New York, NY, USA, 2015. ACM.
- [19] L. Michels, L. Schaeffer, V. Gruber, R. Marcelino, and L. Casagrande. Remote compression test machine for experimental teaching of mechanical forming. *International Journal of Online Engineering*, 12(4):20–22, 2016.
- [20] S. Papavlasopoulou, M. N. Giannakos, and L. Jaccheri. Creative programming experiences for teenagers: Attitudes, performance and gender differences. In *Proceedings of the The 15th International Conference on Interaction Design and Children*, IDC '16, pages 565–570, New York, NY, USA, 2016. ACM.
- [21] G. Pasolini, A. Bazzi, and F. Zabini. A raspberry pi-based platform for signal processing education [sp education]. *IEEE Signal Processing Magazine*, 34(4):151–158, 2017.
- [22] S. Patil, K. Supriya, M. Uma, R. Shettar, and P. Kumar. Open ended approach to empirical learning of iot with raspberry pi in modeling and simulation lab. pages 179–183, 2017.
- [23] J. Qi, A. b. Huang, and J. Paradiso. Crafting technology with circuit stickers. In *Proceedings of the 14th International Conference on Interaction Design and Children*, IDC '15, pages 438–441, New York, NY, USA, 2015. ACM.
- [24] M. Resnick. All I Really Need to Know (About Creative Thinking) I Learned (by Studying How Children Learn) in Kindergarten. In *6th ACM SIGCHI Conference on Creativity & Cognition*, C&C '07, pages 1–6, New York, NY, USA, 2007. ACM.
- [25] M. Resnick and B. Silverman. Some reflections on designing construction kits for kids. In *Conference on Interaction Design and Children*, IDC '05, pages 117–122, New York, NY, USA, 2005. ACM.
- [26] G. T. Richard and Y. B. Kafai. Making physical and digital games with e-textiles: A workshop for youth making responsive wearable games and controllers. In *Proceedings of the 14th International Conference on Interaction Design and Children*, IDC '15, pages 399–402, New York, NY, USA, 2015. ACM.

- [27] G. T. Richard, Y. B. Kafai, B. Adleberg, and O. Telhan. Stitchfest: Diversifying a college hackathon to broaden participation and perceptions in computing. In *Proceedings of the 46th ACM Technical Symposium on Computer Science Education*, SIGCSE '15, pages 114–119, New York, NY, USA, 2015. ACM.
- [28] I. Russell, K. H. Jin, and M. Sabin. Make and learn: A cs principles course based on the arduino platform. In *Proceedings of the 2016 ACM Conference on Innovation and Technology in Computer Science Education*, ITiCSE '16, pages 366–366, New York, NY, USA, 2016. ACM.
- [29] J. Schaeffer and R. Lindell. Arduino in museum exhibition: Lessons learned when working with design students inexperienced in coding. In *Proceedings of the Ninth International Conference on Tangible, Embedded, and Embodied Interaction*, TEI '15, pages 715–720, New York, NY, USA, 2015. ACM.
- [30] J. Schaeffer and R. Lindell. It could just as well have been in greek: Experiences from introducing code as a design material to exhibition design students. In *Proceedings of the TEI '16: Tenth International Conference on Tangible, Embedded, and Embodied Interaction*, TEI '16, pages 126–132, New York, NY, USA, 2016. ACM.
- [31] E. Schweikardt. Modular robotics as tools for design. In *6th ACM SIGCHI Conference on Creativity & Cognition*, C&C'07, pages 298–298, New York, NY, USA, 2007. ACM.
- [32] D. Ursutiu, C. Samoila, and V. Jinga. Creative developments in labview student training: (creativity laboratory - labview academy). pages 309–312, 2017.
- [33] H. Z. Wang, X. L. Zhang, W. Li, P. Q. Yang, C. Liu, and C. H. Ren. The application research on mini-type magnetic resonance imaging instrument. In *2007 IEEE/ICME International Conference on Complex Medical Engineering*, pages 1996–1999, May 2007.
- [34] G. Wetzstein, R. Konrad, H. Ikoma, and N. Padmanaban. Build your own vr system an introduction to vr displays and cameras for hobbyists and educators. 2017.
- [35] J. Wolfer and W. Keeler. From geiger-counters to file systems: Remote hardware access for the operating systems course. *International Journal of Online Engineering*, 12(9):26–31, 2016.

---

## OpinionPaper

---

- [36] S. Aaron, A. Blackwell, and P. Burnard. The development of sonic pi and its use in educational partnerships: Co-creating pedagogies for learning computer programming. *Journal of Music, Technology and Education*, 9(1):75–94, 2016.
- [37] S. Adinandra, N. A. Adhilaga, and D. Erfawan. Waybot: A low cost manipulator for playing javanese puppet. In *2015 7th International Conference on Information Technology and Electrical Engineering (ICITEE)*, pages 376–381, Oct. 2015.
- [38] A. Altadmri, N. C. Brown, and M. Kölling. Using bluej to code java on the raspberry pi. In *Proceedings of the 46th ACM Technical Symposium on Computer Science Education*, SIGCSE ’15, pages 178–178, New York, NY, USA, 2015. ACM.
- [39] D. Assante and C. Fornaro. Involving graduating engineers in applying a commercial brain computer interface to motorized wheelchair driving. In *2015 IEEE Global Engineering Education Conference (EDUCON)*, pages 446–452, Mar. 2015.
- [40] D. Bar-El and O. Zuckerman. Maketec: A makerspace as a third place for children. In *10th International Conference on Tangible, Embedded, and Embodied Interaction*, TEI ’16, pages 380–385, New York, NY, USA, 2016. ACM.
- [41] L. Bertelli, F. Bovo, L. Grespan, S. Galvan, and P. Fiorini. Eddy: An open hardware robot for education. volume 216, pages 47–54, 2007.
- [42] C. Brady, D. Weintrop, K. Gracey, G. Anton, and U. Wilensky. The ccl-parallax programmable badge: Learning with low-cost, communicative wearable computers. In *Proceedings of the 16th Annual Conference on Information Technology Education*, SIGITE ’15, pages 139–144, New York, NY, USA, 2015. ACM.
- [43] M. Brinkmeier and D. Kalbreyer. A case study of physical computing in computer science education. In *11th Workshop in Primary and Secondary Computing Education*, WiPSCE ’16, pages 54–59, New York, NY, USA, 2016. ACM.
- [44] J. D. Brock. Being the dba (database administrator): Nifty assignment. *Journal of Computing Sciences in Colleges*, 31(2):275–277, Dec. 2015.
- [45] D. D. Buhl-Brown. Developing a robotics education platform using android based cellbots (abstract only). In *Proceedings of the 46th ACM Technical Symposium on Computer Science Education*, SIGCSE ’15, pages 714–714, New York, NY, USA, 2015. ACM.
- [46] A. Butterfield and K. Branch. Results & lessons learned from a chemical engineering freshman design laboratory. In *ASEE Annual Conference and Exposition*, Seattle, WA, USA, 2015.

- [47] S. Cheong, I. Chai, and R. Logeswaran. Quick response multimodal learning system with raspberry pi. *Asian Journal of Information Technology*, 15(16):2737–2742, 2016.
- [48] D. Connors, K. Dunn, and R. Bueter. Pycomparch: Python-based modules for exploring computer architecture concepts. In *Proceedings of the Workshop on Computer Architecture Education*, WCAE '15, pages 4:1–4:6, New York, NY, USA, 2015. ACM.
- [49] G. G. da Silva and C. A. Petry. Teaching ac-ac converters using voltage regulators. In *2015 IEEE 13th Brazilian Power Electronics Conference and 1st Southern Power Electronics Conference (COBEP/SPEC)*, pages 1–6, Nov. 2015.
- [50] L. de la Torre, M. Guinaldo, R. Heradio, and S. Dormido. The Ball and Beam System: A Case Study of Virtual and Remote Lab Enhancement With Moodle. *IEEE Transactions on Industrial Informatics*, 11(4):934–945, Aug 2015.
- [51] C. Dhal and A. Wahi. Psycho-physiological training approach for amputee rehabilitation. *Biomedical instrumentation & technology*, 49(2):138–143, 2015.
- [52] B. Dixon. Code isolation for accurate performance scoring using raspberry pis. *J. Comput. Sci. Coll.*, 31(4):94–99, Apr. 2016.
- [53] W. J. Esposito, F. A. Mujica, D. G. Garcia, and G. T. A. Kovacs. The lab-in-a-box project: An arduino compatible signals and electronics teaching system. In *2015 IEEE Signal Processing and Signal Processing Education Workshop (SP/SPE)*, pages 301–306, Aug. 2015.
- [54] D. A. Fields, K. A. Searle, and Y. B. Kafai. Deconstruction kits for learning: Students' collaborative debugging of electronic textile designs. In *Proceedings of the 6th Annual Conference on Creativity and Fabrication in Education*, FabLearn 16, pages 82–85, New York, NY, USA, 2016. ACM.
- [55] K. Fox, W. Mongan, and J. Popyack. Raspberry hadoopi: A low-cost, hands-on laboratory in big data and analytics (abstract only). In *Proceedings of the 46th ACM Technical Symposium on Computer Science Education*, SIGCSE '15, pages 687–687, New York, NY, USA, 2015. ACM.
- [56] S. Gokceli, H. B. Tugrel, S. Pisirgen, G. K. Kurt, and B. ĩrs. A building automation system demonstration. In *2015 9th International Conference on Electrical and Electronics Engineering (ELECO)*, pages 56–60, Nov. 2015.
- [57] B. Gottlob. Real time occupancy notification: A comparison between passive infrared and ibeacon implementations (abstract only). In *Proceedings of the 46th ACM Technical Symposium on Computer Science Education*, SIGCSE '15, pages 716–716, New York, NY, USA, 2015. ACM.

- [58] K. Hajdarevic and S. Konjicija. A low energy computer infrastructure for radio voip supported communication and sdr aprs in education and disaster relief situations. In *2015 38th International Convention on Information and Communication Technology, Electronics and Microelectronics (MIPRO)*, pages 556–561, May 2015.
- [59] R. C. Hill. Hardware-based activities for flipping the system dynamics and control curriculum. In *2015 American Control Conference (ACC)*, pages 2777–2782, July 2015.
- [60] T. U. Islamgozhayev, S. S. Mazhitov, A. K. Zholmyrzayev, and E. T. Toishybek. Iict-bot: Educational robotic platform using omni-directional wheels with open source code and architecture. In *2015 International Siberian Conference on Control and Communications (SIBCON)*, pages 1–3, May 2015.
- [61] E.-S. Katterfeldt, D. Cuartielles, D. Spikol, and N. Ehrenberg. Talkoo: A new paradigm for physical computing at school. In *Proceedings of the The 15th International Conference on Interaction Design and Children, IDC '16*, pages 512–517, New York, NY, USA, 2016. ACM.
- [62] A. Kobeissi, A. Sidoti, F. Bellotti, R. Berta, and A. De Gloria. Building a tangible serious game framework for elementary spatial and geometry concepts. pages 173–177, 2017.
- [63] C. Kopic and K. Gohlke. Inflatibits: A modular soft robotic construction kit for children. In *Proceedings of the TEI '16: Tenth International Conference on Tangible, Embedded, and Embodied Interaction*, TEI '16, pages 723–728, New York, NY, USA, 2016. ACM.
- [64] S. P. Krishnamoorthy and V. Kapila. Using a visual programming environment and custom robots to learn c programming and k-12 stem concepts. In *Proceedings of the 6th Annual Conference on Creativity and Fabrication in Education, FabLearn '16*, pages 41–48, New York, NY, USA, 2016. ACM.
- [65] R. S. Lawyer. Student driven digital signage. In *Proceedings of the 2015 ACM Annual Conference on SIGUCCS*, SIGUCCS '15, pages 133–135, New York, NY, USA, 2015. ACM.
- [66] Y. Lee. Integrated information and communication learning model for raspberry pi environment. *ARPN Journal of Engineering and Applied Sciences*, 12(17):5088–5093, 2017.
- [67] Q. H. Mahmoud, D. Qendri, and M. Lescisin. The sensorian shield: Transforming the raspberry pi into an iot platform. In *Proceedings of the 47th ACM Technical Symposium on Computing Science Education, SIGCSE '16*, pages 162–162, New York, NY, USA, 2016. ACM.

- [68] S. Marichal, E. Bakala, A. Rosales, F. Perilli, G. Sansone, J. Blat, and A. Pires. Ceta: Open, affordable and portable mixed-reality environment for low-cost tablets. 2017.
- [69] M. Martinez, J. Champion, T. Gholami, M. Rittikaidachar, A. Barron, and A. Okamura. Open source, modular, customizable, 3-d printed kinesthetic haptic devices. pages 142–147, 2017.
- [70] D. L. McPherson, A. R. Ofoli, and T. D. Loveless. Basketballbot: Developing an intelligent controls teaching platform using labview, matlab, and arduino. In *SoutheastCon 2015*, pages 1–8, Apr. 2015.
- [71] R. Meintjes and H. Schelhowe. Inclusive interactives: The transformative potential of making and using craft-tech social objects together in an after-school centre. In *Proceedings of the The 15th International Conference on Interaction Design and Children*, IDC '16, pages 89–100, New York, NY, USA, 2016. ACM.
- [72] D. Mohapatra, N. Kashyap, A. Biswal, and S. Padhee. Design of measurement and data acquisition laboratory for instrumentation engineering course. 2017.
- [73] H. Mostefaoui and A. Benachenhou. Design of a remote electronic laboratory. In *2015 International Conference on Interactive Mobile Communication Technologies and Learning (IMCL)*, pages 160–162, Nov. 2015.
- [74] K. Muterspaw, T. Urner, R. Lewis, I. Babic, D. Srinath, C. Peck, D. Cerda-Granados, P. Lemiszki, M. Sánchez-Miranda, M. Mayorga-Méndez, O. Petursson, and B. Smith. Multidisciplinary research and education with open tools: Metagenomic analysis of 16s rRNA using arduino, android, mothur and xse. In *Proceedings of the 2015 XSEDE Conference: Scientific Advancements Enabled by Enhanced Cyber-infrastructure*, XSEDE '15, pages 22:1–22:8, New York, NY, USA, 2015. ACM.
- [75] K. Peppler and K. Wohlwend. Theorizing the nexus of steam practice. *Arts Education Policy Review*, pages 1–12, 2017.
- [76] P. Putjorn, C. S. Ang, and D. Farzin. Learning iot without the "i"- educational internet of things in a developing context. In *Proceedings of the 2015 Workshop on Do-it-yourself Networking: An Interdisciplinary Approach*, DIYNetworking '15, pages 11–13, New York, NY, USA, 2015. ACM.
- [77] P. Reguera, S. Alonso, M. Domínguez, M. Prada, A. Morín, and J. Fuertes. Using low-cost open source hardware to control puma560 motors. *IFAC-PapersOnLine*, 50(1):9180–9185, 2017.
- [78] J. Reitingner, P. Balda, and M. Schlegel. Steam turbine hardware in the loop simulation. pages 380–385, 2017.



- [79] G. T. Richard and Y. B. Kafai. “maker innovators”: A workshop for youth creating responsive and wearable game interfaces with tangible and digital construction toolkits (abstract only). In *Proceedings of the 46th ACM Technical Symposium on Computer Science Education*, SIGCSE '15, pages 682–682, New York, NY, USA, 2015. ACM.
- [80] J. Sadler, K. Durfee, L. Shluzas, and P. Blikstein. Bloctopus: A novice modular sensor system for playful prototyping. In *Proceedings of the Ninth International Conference on Tangible, Embedded, and Embodied Interaction*, TEI '15, pages 347–354, New York, NY, USA, 2015. ACM.
- [81] K. A. Searle, C. Tofel-Grehl, and V. Allan. The e-textiles bracelet hack: Bringing making to middle school classrooms. In *Proceedings of the 6th Annual Conference on Creativity and Fabrication in Education*, FabLearn '16, pages 107–110, New York, NY, USA, 2016. ACM.
- [82] A. Srivastava and S. Dawle. Mudra: A multimodal interface for braille teaching. In *Proceedings of the 6th Augmented Human International Conference*, AH '15, pages 169–170, New York, NY, USA, 2015. ACM.
- [83] D. Sullivan, W. Chen, and A. Pandya. Design of remote control of home appliances via bluetooth and android smart phones. pages 371–372, 2017.
- [84] M. Tan, Y. Yang, and P. Yu. The influence of the maker movement on engineering and technology education. *World Transactions on Engineering and Technology Education*, 14(1):89–94, 2016.
- [85] D. Tarnoff. Integrating the arm-based raspberry pi into an architecture course. *Journal of Computing Sciences in Colleges*, 30(5):67–73, 2015.
- [86] D. Trivedi and J. Pearce. Open source 3-d printed nutating mixer. *Applied Sciences (Switzerland)*, 7(9), 2017.
- [87] M. Vizner and A. Strawhacker. Curious construction kit: A programmable building kit for early childhood. In *Proceedings of the 6th Annual Conference on Creativity and Fabrication in Education*, FabLearn '16, pages 90–93, New York, NY, USA, 2016. ACM.
- [88] D. Wang, L. Zhang, Y. Qi, and F. Sun. A tui-based programming tool for children. In *Proceedings of the 2015 ACM Conference on Innovation and Technology in Computer Science Education*, ITiCSE '15, pages 219–224, New York, NY, USA, 2015. ACM.
- [89] B. Yulianto, R. Layona, and L. Dewi. A low-cost wireless multi-presentation on single screen in classroom using raspberry pi. *International Journal of Web-Based Learning and Teaching Technologies*, 12(3):23–33, 2017.

---

## PhilosophicalPaper

---

- [90] M. Cata. Smart university, a new concept in the internet of things. In *2015 14th RoEduNet International Conference - Networking in Education and Research (RoEduNet NER)*, pages 195–197, Sept. 2015.
- [91] E. Schweikardt and M. D. Gross. A brief survey of distributed computational toys. In *First IEEE International Workshop on Digital Game and Intelligent Toy Enhanced Learning (DIGITEL'07)*, pages 57–64, Mar. 2007.

---

## SolutionProposal

---

- [92] Y. Mita and Y. Kawahara. 15-year educational experience on autonomous electronic information devices by flipped classroom and try-by-yourself methods. *IET Circuits, Devices and Systems*, 11(4):321–329, 2017.

---

## ValidationResearch

---

- [93] S. Puente, A. ĩŁjbeda, and F. Torres. e-health: Biomedical instrumentation with arduino. *IFAC-PapersOnLine*, 50(1):9156–9161, 2017.