



Figure 1: TechKreativ encompasses the design of digital fabrication tools, materials, and programming environments for learning.

2018 Edith Ackermann Award— Bildungsmedien: where TechKreativ meets Footwork

Michael Horn

Computer Science and Learning Sciences
Northwestern University
Evanston, Illinois, USA
michael-horn@northwestern.edu

Heidi Schelhowe

Computer Science
University of Bremen
Bremen, Germany
schelhowe@tzi.de

ABSTRACT

In 2017, Paulo Blikstein, Dor Abrahamson, and the Interaction Design and Children Community established an annual award in the memory of Edith Ackermann to recognize the work of two scholars, one emergent and one eminent. These individuals would be acknowledged for their accomplishments but also tasked with a mission to complete for the following year's conference. Through a series of meetings they would produce an artifact that would be shared with IDC. In 2018, Michael Horn was recognized as the emergent scholar and Heidi Schelhowe was recognized as the eminent scholar. Through a series of conversations culminating in an in-person visit, Mike and Heidi have written this essay in which they share resonating themes from their conversations.

KEYWORDS

Edith Ackermann Award, Bildung, Bildungsmedien, Making, Constructionism, creativity

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INTRODUCTION

Edith Ackermann was a pioneer in the understanding of children as “active builders of their own cognitive tools,” both internal and external [1]. She critically reflected on the role of design and advocated for experiences that allow learners to both “dive in” and “step out” to reflect. These ideas have touched us both in the development of our careers. Edith’s visits to the University of Bremen were a highlight for the dimeb (Digital Media in Education) research group. We remember her deep thinking, friendly advice, and impressing personality—these were times of great enrichment for us all. Although Mike had fewer opportunities to interact with Edith in person, those moments of face-to-face interaction had a lasting impact on his work. We are honored and humbled to have received the 2018 Edith Ackermann Award from the Interaction Design and Children community, and we will continue to strive to live up to her namesake.

RESONATING THEMES IN OUR WORK

In the past year, we have had a series of conversations that culminated in Mike visiting Bremen in December 2018 to meet with Heidi and her collaborators. In reading each other’s work, there were many resonating themes at the intersection of Constructionism and Making, perhaps the most important of which was the notion of *Bildung*, which, from German, translates into a kind of deep and sustainable learning—a “learning to be” instead of “learning about”. As both of us consider ourselves to be designers of educational materials across a range of settings from skateparks to schools, *Bildung* is a valuable orienting perspective that emphasizes the development of individual identity through mediated explorations of digital, physical, and social worlds. As we learn to use tools to shape artifacts and the environment, so too are we shaped by the same processes. By sharing artifacts with others, we, in turn, shape the social and cultural landscape around us.

For Heidi, digital media and tools become *Bildungsmedien*, the material through which learners express ideas, interact with the world, and create artifacts to share [8]. For Mike, cultural forms of literacy, learning, and play are central to the design of any learning environment [6]. In crafting *Bildungsmedien*, we draw on a rich cultural landscape that can shape social engagement and appeal to a broader and more diverse range of learners. For both of us, the role of design is to foster deep and meaningful learning, to allow learners to dive in head over heels, step back, and play back experiences in an ongoing process of learning about the world and learning about ourselves [1, 2].



Figure 2: In The Swarm, children interact with a swarm of lights that respond to gesture and motion. They are able to dive in to immerse themselves in the experience and then step out to reflect on the algorithm that created the collective movement.

HEIDI AND MIKE’S ONGOING WORK

For almost two decades, Heidi and her many collaborators have designed and studied digital fabrication workshops for children under the name *TechKreativ*. *TechKreativ* encompasses the design of tools, materials, programming environments, and activities for learning. Among the many *TechKreativ*



Figure 3: With the EduWear toolkit from TechKreativ, children engineer their own intelligent textiles.

projects, the *eduwear* toolkit was a close collaboration with Leah Buechley in which children used the Lilypad Arduino platform to create their own “intelligent” textiles [7]. Another project called “The Swarm” embodies Edith’s metaphor of diving in and stepping out. Children engage in lively interactions with a swarm of lights projected on the floor that respond to gesture and movement. Children dive into the swarm (immersing themselves in the experience) and then step back to reflect on the algorithm that created collective movement [5]. In more recent projects, teens are designing and prototyping their own BMX ramps that they reflect on in relation to life size equipment [9].

For Mike, an inspirational example of this close to home is an increasingly popular style of music and dance called *Footwork* that emerged from the South and West sides of Chicago in the early 2000s [4]. Characterized by rapid, highly syncopated beats interlaced with vocal stabs and digitally generated samples, the rhythm of Footwork is at once hypnotically irregular and mechanically precise. The scholar, Dhanveer Singh Brar, adopts the term *phonic materiality* to conceptualize Footwork: “This phonic materiality has been theorized by those generating Footwork via the formulation *tek*. They self-identify as *Ghettoteknitianz*, they declare themselves to be *Architeks*, and they conceive of their social relations as generative of *Teklife*” [4]. Brar sees music as a means of production of an urban ecology that is “manufactured in the relations between dance, sound, territory, race, and class.” In this sense, digital tools have become a critical element of the Bildungsmedien that empower the social-digital construction of Footwork’s *teklife*.

Inspired by the culture of Footwork, Mike and his collaborators have been developing TunePad (<https://tunepad.live>), an online learning environment that supports creative musical expression

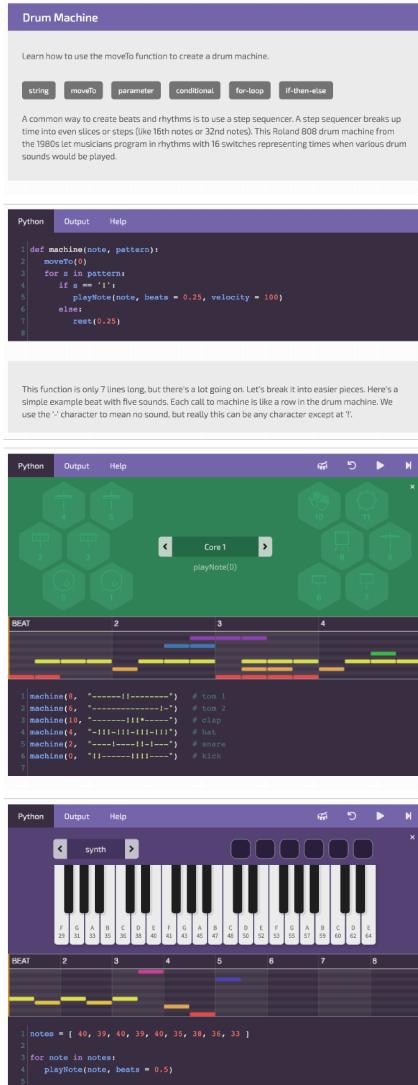


Figure 4: TunePad Dropbooks contain collections of instruments, text, lyrics, multimedia, and code.

through computer programming. In this work, we see music as both a powerful motivator for learning and a pervasive form of literacy with abundant connections to computer science [3]. TunePad projects take the form of interactive web pages called Dropbooks that combine playable musical instruments, text, lyrics, multimedia elements, and runnable segments of Python code. By adding text and multimedia cells to projects, we hope that learners will use TunePad as a more personal means of creative expression by adding visual artwork, lyrics, poetry, and personal reflections to their music.

CONCLUSION

We close by thanking the IDC community for this opportunity to collaborate and learn from one another. For Mike, in particular, the concept of Bildungsmedien has helped frame and reorient his work in exciting new directions. We feel fortunate to follow in the tradition of scholars such as Edith Ackermann, Mike Eisenberg, and many, many others to share in the collective work of the IDC.

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