Fiber-Crafting STEM Learning

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In the history of technology innovation, fiber crafts have played a prominent role. One notable example is the Jacquard loom that inspired the use of punch cards in the first programmable computer in the 1940s (Plant, 1995). Other examples

of the tight interconnection of scientific innovation and fiber crafts include modeling hyperbolic planes through crochet in mathematics (Henderson & Taimina, 2001). Despite the tight coupling, fiber crafts are frequently associated with less valued domestic practices. One prominent exception is e-textiles, which can foster learning of computer science and engineering concepts (Kafai et. al, 2019; Peppler & Glosson, 2013). Still, it remains underexplored how nonelectronic fiber crafts can be leveraged for high-quality STEM learning with ramifications of who and what is recognized as STEM. The workshop was organized as a make-test gallery walk around three main STEM themes: (a) computer science, (b) engineering, and (c) mathematics–with multiple crafts that facilitated playing with STEM concepts. The craft activities correspond with each of the three STEM areas. For computer sciences, activities included weaving a skip or lace pattern as well as embroidering a twisted square pattern to explore computer science concepts, such as conditional statements, variables, and parallelism. For engineering, activities included folding a basket, creating a doll skirt, and animating a twisted square to materialize spatial visualization as well as to sew 3D rotations and hinges. For mathematics, activities included weaving on a frame loom, pleating a bag, and crocheting a circle to explore mathematics principles such as slope and multiplicative proportional reasoning.

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