

Wellbotics: Makerspace. Mindfulness. Motivation.

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ABSTRACT

Wellbotics delivers Pop Up Makerspaces to cancer care communities and other safe spaces. Originally designed for children of cancer survivors, Wellbotics uses instructional robots to leverage Science, Technology, Engineering, Art, Math and Mindfulness (STEAM +M) to increase problem solving, communication and cooperation amongst children facing family trauma. Using a five step instructional design, 90 minute sessions run from four to six consecutive weeks. The experience builds connections among participants while helping users understand possible effects of Family Medical Trauma and/or Adverse Childhood Experiences (ACEs). Participants also learn strategies to help cope with social emotional effects known to accompany childhood trauma. This paper introduces Wellbotics, with its five step design, began as a workshop designed to introduce children of breast cancer patients to basic robotics and explain possible parental hair loss. Social workers from organizations that offer Wellbotics report an increase in factors correlated with resilience among individual participants and families.

Keywords

Makerspace, Cancer, Trauma Informed, Childhood Trauma, Family Trauma, Robotics, Coding, Mindfulness, STEAM, Adverse Childhood Experiences, Resilience

1. DESCRIPTION

1.1 Description of your setting

The World Health Organization (WHO) defines health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.” (2006). Robots embody interconnected physical, mental, and social characteristics thereby providing compelling models for teaching and learning about health and personal wellbeing. Wellbotics’ is robotics instruction delivered through Pop Up Makerspaces in partnership with Cancer Support Communities and other community based organizations. Each 90 minute session is part of a four to six session workshop that promotes technological tinkering as a way to support children facing trauma and to help them build resilience.

Since 2016, 80 participants, ranging from five to eighteen years old, learned coping strategies and relevant information to help them deal with the effects of a family cancer diagnosis. Partner organizations like Cancer Support Community locations, Gilda’s Club Westchester and Gilda’s Club NYC worked with Wellbotics to provide vital programming designed for digital natives with the goal of reaching as many of the almost three million children affected by a parent’s cancer throughout the United States as possible.

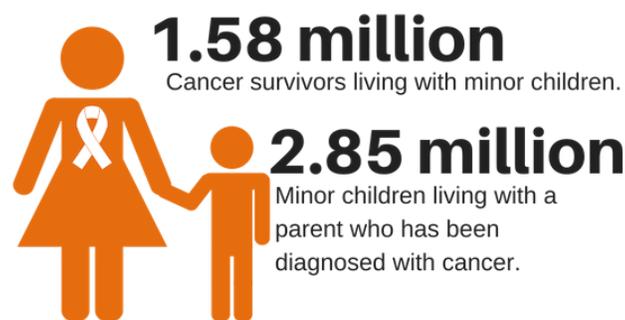


Image 1. Number of minor children impacted by living with a parent who has cancer. (Howlander et. al., 2013)

Since 2018, Wellbotics has expanded to serve children who are facing other types of traumatic experiences. To that end, an additional 130 children served by Wellbotics are not self identified as affected by cancer. These children have other traumatic experiences in common such as parental incarceration or housing instability.

Each group of children has varying experience with robotics and making, what they share is experience with childhood or family trauma and access to a partner organization with the mission to help families and children in need.



Image 2. Dr. Pam Davis discussing the brain with children in the “Think” phase of a Wellbotics session

1.2 Description of the educational experience

During each Wellbotics Pop Up Makerspace, children receive individualized instruction as well as peer and professional support. Children learn concepts like computational thinking and mechanical engineering along with embodied cognition/mindfulness strategies that have been shown to deepen comprehension and improve self efficacy.

Each Wellbotics session lasts 60-90 minutes. Sessions run for four to six weeks. In a recent workshop, Wellbotics successfully engaged five to eight year old children of breast cancer survivors while addressing their social, emotional and intellectual needs by following a five step instructional plan.

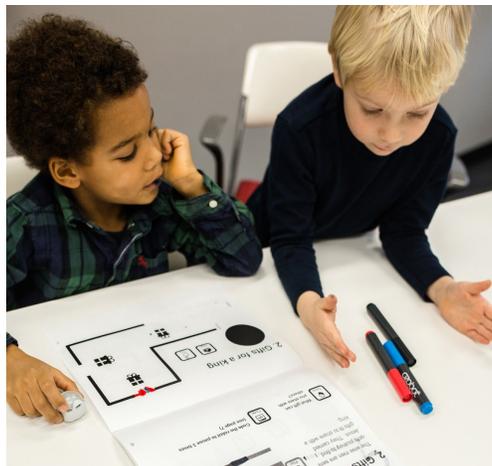


Image 3. A pair of programmers learning to code in the “Plan” phase of a Wellbotics session

Table 1. Wellbotics instructional plan with “Hats off to Mom” lesson overview



Each Wellbotics session begins with a story of triumph over adversity. The effects of adversity on the brain and the capacity of mindfulness to help the brain repair itself are often discussed.



Read the picture book Nowhere hair by Sue Glader aloud. The book helps children understand chemotherapy and how cancer and hair loss are not their fault. It is a story about fear and sadness, being silly and wearing crazy hats, and loving those who look different.



Through the lens of hands on activities with robotics, coding, and digital making, children prepare to retell key parts of the story. Some children choose to tell original stories of their own.



Guide children through retelling part of the story from Nowhere hair while teaching the basics of Ozobot robots using the “Hats off to Mom!” workbook. Participants learn to navigate the robot to interact with representations of sleepy, crabby, silly, and happy hats.



Children apply what they’ve learned or use skills they already have to digitally retell more of the story. Some children choose to tell original stories of their own.



Using the Wellbotics “Hats off to Mom!” game board and Ozobot robots, children construct robot based narratives and pair program.



Children build or modify an existing robot and make digital props to use in retelling the story. Robots are calibrated and the code is revisited and revised. Mindfulness strategies are introduced.



Using the “Hats off to Mom!” game board, acorn capsules, and a laser cutter, students create models for their game. The acorn capsules are filled with positive affirmations and serve as focus objects for a mini lesson on mantra meditation.



Children run the program and retell the story. Often, organizations create an opportunity to exhibit the final projects.

2. CONCLUSION

2.1 Results



Image 4. Adults who report experiencing childhood trauma (Walsh, 2015)

Research shows that 60% of children report experiencing trauma (Walsh, 2015). This childhood trauma leads to social, mental, physical and medical difficulties that often last a lifetime if the traumatic events are not addressed. Trauma informed practices, such as working with peers to solve problems, create catalysts for both increased cognition and hope as well as deeper emotional connection. Cognitive awareness, hope and emotional connections are known to build resilience, resilience that can help mitigate the effects of trauma.

Wellbotics allows children to build resilience by meeting others faced with similar traumatic experiences and through meeting challenges that involve designing, making and programming robots. Participants learn problem solving as well as enhance their critical thinking skills while having fun together in a stress free setting. Although conclusive evidence has yet to be collected, anecdotally these are skills that the children apply in other areas of their lives, skills found to lead to resilience in children who have experienced trauma.

Wellbotics started as a passion project during a time of physical and emotional healing. The first Wellbotics workshops were offered in partnership with Gilda's Club Westchester at a time when founder, Dr. Pam Davis was barely finished with treatment for her own cancer. Offering help to the children and families served as motivation for her own wellness, motivation that children and parents that attended Wellbotics sessions insist was contagious.

According to the American Cancer Society, "children can feel all alone if a parent is sick, and they don't know that others have the same feelings and worries that they do. It can be comforting for kids to meet others who are going through what they are". The Wellbotics experience promotes connection through teamwork. Children in the initial phase of the program connected with each other and the Cancer Support Center staff, and parents made connections too. Also promising, some children who were reluctant to accept support before Wellbotics returned to the Cancer Support Center to receive additional counseling based on their experience.

Because the experience was volunteerism, changes to the initial offering are difficult to imagine. However, after sharing Wellbotics with older children, young adults and those outside the cancer community, the response has been encouraging and has led to further development of the curriculum.

2.2 Broader value

Wellbotics began by focusing on children of cancer survivors, yet has proven that any person who has experienced trauma could potentially benefit from this program. Professionals who could offer Wellbotics include: social workers, nurses, teachers, and mental health providers. Attendees at FabLearn would benefit by learning more about the theory behind Wellbotics interventions; it picks up where play therapy and

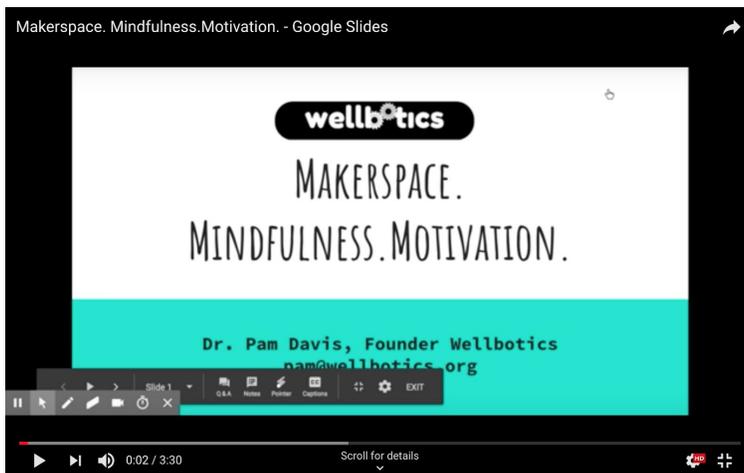
art therapy leaves off and is especially well suited for digital natives. In addition, the program is so easy to deliver that even facilitators without technological experience could learn the strategies and share them with their clients.

Further, the New York State Department of Education passed policy in 2018 mandating all public schools provide mental health services for their students. This presents an opportunity for FabLearn attendees to implement Wellbotics interventions as a response to the call for increased mental health services. Digitally fluent members of the maker-centered/hands-on/digital fabrication learning communities often already work for or with public schools. Learning more about Wellbotics would allow them to turn-key training or perhaps work directly with children in and/or learning about trauma.

2.3 Relevance to theme

Ted Talks, public school staff development meetings and pediatric medical journals include terms like Adverse Childhood Experiences (ACEs), resilience and growth mindset. All fields that discuss these ideas agree that providing interventions for children who have experienced trauma is not just a social challenge. Trauma in childhood is known to affect physical, emotional, financial, and educational outcomes later in life. Wellbotics is an intervention that demonstrates the role that Maker Education can play in helping children in trauma meet many of their challenges, thereby preparing them for continued wellbeing.

2.4 Link to video



<https://www.youtube.com/watch?v=cauqXXnAr8A>

3. BIOS

Pamela Davis earned her doctorate degree in Instructional Media and Technology from Teachers College, Columbia University. She is a twenty-five year veteran classroom teacher. Dr. Davis has a balance of education and experience in instructional technology and has taught kindergarten to post-graduate students. She has served as a consultant for research and evaluation related to K-12 STEM for Universities, nonprofit and government organizations throughout the United States and abroad.

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