Little Builders: Empowering At-risk Children by Building and Design

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Abstract

Little Builders is a social enterprise that aims to disrupt Thai education by employing constructionist design paradigms and human-centered design processes in at-risk formal and informal schools to foster a grit and growth mindset. We believe that constructing is a valuable learning process for the students; "children don't get ideas; they make ideas" (Kafai & Resnick, 1996). *Little Builders* was first established in early 2014 by a group of recent graduates from various backgrounds but a common goal of shifting the Thai classroom from instructionist to constructionist systems, where students can work on their own meaningful project, learn at their own pace, and at the same time create a community of learners. Through our two years of commitment, *Little Builders* has received a grant from Thai Social Enterprise Office and currently has 7 core team members, over 100 active volunteers, and 533 supporters.

Keywords

Constructionist design paradigm; Human-centered design; Thailand; At-risk students

Literature Review

Instructionism views teaching students as a linear progression: from fact to analysis and from basic skills to more complicated skills (Wenglinsky, 2005). The teacher is the center of knowledge in the instructionist classroom and she or he would spend the majority of class time on conveying new knowledge to the students. Piaget asserts that "knowledge is not simply transmitted from teacher to students, but actively constructed by the mind of learner" (Kafai & Resnick, 1996, p. 1). Constructionism is in sharp contrast to the didactic approach. For instructionists, transmitting knowledge is a quick process by employing a top-down approach from expert to novice. It is taught by showing and moving toward abstractions. The knowledge also has to be in an accurate form of answer. Constructionist design paradigm is a slow process that encourages emergent knowledge sharing and embraces a community of learners. It is facilitated by building and moves towards concrete objects. Thus, the result of learning can be messy because learners are always experimenting and tinkering (Holbert, 2015).

Human-centered design (HCD) comprises of 5 distinct iterative steps: empathy, define, ideate, prototype, and test (IDEO, 2015). It starts from understanding the needs and motivation of targeted users. The human-centered designer shares core elements of the constructionist in being optimistic, experimental, and collaborative (Brown, 2008). Moreover, design thinkers are optimists believing that their designs can create change no matter how big the obstacles are; for them, solving challenges is an enjoyable process. Since the HCD is an iterative process, it gives the designers permission to fail fast and learn from their previous mistakes. They can always come up with new ideas, add on to them, then receive feedback to fix and iterate. HCD is all about learning by doing. (IDEO, 2015)

Previous Projects

Little Builder's first project was piloted at *Janusz Korczak School*, an informal school for HIV+, immigrant, low-income, and street children in Slum Klong Teoi with 22 students and 8 volunteers.

We began by teaching simple circuitry and using a motor to develop low-cost racing cars from recycled milk cartons. We captured students' full attention. Students connected the circuits by themselves and assembled the car within the end of the period just to be able to race with their friends. They said that it felt more like a playground than a classroom. The same lesson was organized in several foundations and informal schools in Bangkok.

The next phase of development was at *Baantawanmai Foundation*, a foster foundation for Thai narcotic at-risk children. There were seventy 9-14 years old participants and almost thirty volunteers. We combined HCD process into students' creations. We started by letting students find their own problems or needs in their own community. They came up with a host of problems. The library was too loud because it is located next to a music room; the decomposing plant and fish caused foul odor from the pond; there were pests in the bathroom; the local farm was too big which took too long to water. They ideated solutions, and developed quick prototypes from scrap materials then presented in front of the whole community. Two ideas were selected to be built by the students and volunteers during *Builder Day.* Together, we designed and created an irrigation system covering an acre, using 300 meters of piping system and almost a thousand sprinklers. The water was supplied by automatic reciprocating pumps, creatively made by modifying salvaged bicycle parts. The pump can either supply the irrigation system directly or fill up a water storage tank for later use. The younger participants also learned the concept of art and chemistry by creating pest repellent candles to solve the problem of pest control in the community's residential area.

Current Project

Seeing the problem with sustainability in running constructionist projects, we seek ways to integrate *Little Builders* in to Thai formal schools and provide professional development for teachers at the same time. We will be initiating our project at Wat Pak Bor School (an urban school under Department of Education Bangkok Metropolitan administration) from November 16, 2015 - February 13, 2016. We received strong support from the school's principal, authorizing 160 8th grade students and 13 teachers to participate in our program. The project will be assessed by pre and post GRIT (Duckworth et al., 2007) and Growth Mindset (Dweck, 2006) assessment.

The participants will be using HCD processes to design and build constructionist projects. The program will start off with ice breaking and team building activities then a full day of overview in HCD processes through activities of building small projects. After giving the participants an overview of constructionist projects and HCD, the participants will come up with their own meaningful project on *Empathy & Define Day*. Coaches will train the participants on interview methods then let them go out to interview the community and be immersed with their target users to figure out the users' needs (define). We will continue to work on the rest of the HCD processes (ideate, prototype, and test) the following week. Once an idea is formulated, the participants will start building on *Builder Day*; the building process will take up to 2 weeks. Since the participants will be presenting and exhibiting their *Little Builders* projects to the public audience, we will also coach them on public speaking skills. The last day of the project is the *Showcase Day,* where we hope to see the participant taking ownership of their projects.

The future of education is no longer a straight line of desks and a chalkboard with standardized tests to measure students' competency, nor it is in front of an iPad screen. *Little Builders* sees the future of education in training the next generation to think and act creatively. Design the tools that allow children to learn, and allow children to design what they want to learn.

Reference

Brown, T. (2008). Design thinking. *Harvard business review*, *86*(6), 84.

Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: perseverance and passion for long-term goals. *Journal of personality and social psychology*, *92*(6), 1087.

Dweck, C. (2006). *Mindset: The new psychology of success*. Random House.

Holbert, N. (2015). *Tool and Toys for Knowledge Construction.* [PowerPoint slides].

IDEO. (2015). Our Approach: Design Thinking. Retrieved from www.ideo.com/about/

Kafai, Y. B., & Resnick, M. (1996). *Constructionism in practice: Designing, thinking, and learning in a digital world*. Routledge.

Wenglinsky, H. (2005). Using technology wisely: The keys to success in schools. Teachers College Press.