What Do Parents Learn from Maker Education?

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ABSTRACT
In 2016, the Darunsikkhalai School for Innovative Learning (DSIL) in Bangkok, Thailand began a project called "Parent's Maker Day.". DSIL is a part of King Mongkut's University of Technology Thonburi and it is known as the first Constructionist school in Thailand. Parents Maker Day is a workshop for parents that allows parents interested in the FabLearn Lab to learn about the FabLearn Lab, explore maker education, and experience it in one day. This workshop is now a routine activity of the school due to the positive effect it has on both parents and facilitators. This paper explores how this workshop evolved and how modeling experiential learning for parents can help parents understand maker education experiences, develop trust about what learning should look like, and empower home and school collaboration supporting long term sustainability of experiential learning.

Keywords
Parent Education; Maker education; collaboration; family workshops; maker day; sustainability

1. Why do parents need to learn about digital fabrication and making?

1.1 Background and purpose of the activities

In 2013, the Digital Fabrication at Darunsikkhalai School for Innovative Learning (DSIL) in Bangkok, Thailand created a FabLearn Lab in school. Back then the idea of a digital fabrication lab was unknown in Thailand. Having a FabLearn Lab in our school sounded very high tech and was warmly welcomed. However, when we stepped out of the "honeymoon phase" of innovation we knew we would have to deal with questions and concerns from stakeholders. What we had learned by heart from Seymour Papert's definition of Technocentric Thinking and Computer Criticism (Papert 1987) started to come true in real life. Papert suggested that constructionist use of technology would be criticized simplistically on the basis of technology, or would be segregated and made into a separate subject, depriving it of the power to change the whole school. In fact, as Papert predicted, the most frequently asked questions from parents were about safety and why making is important for their children when FabLearn Lab class hours take away time from other academic classes at school. But there were other reactions too. While some parents doubted the costs and benefits of bringing technology to their children at early ages, other parents pushed their children very hard to excel in the FabLearn Lab. Teachers had to deal with concerns and pressure from both extremes. Presentations and discussions did not seem to satisfy either group ofparents.

In 2016, I came up with the idea of Parent's Maker Day to cope with the situation. I invited an especially active group of parents to attend a one day workshop. This workshop was designed so the parents would get first hand experience of maker education and learn like their child. In the morning when they dropped off their kids at school, they could come to the lab and participate in a seven hour workshop with other parents (10-12 parents each time). Once they finished their class, their children met them in the lab. After three years, we have continued to run this workshop once in every trimester. This workshop is on voluntary basis and parents pay about $15 fee for the materials.

1.2 Activities design and reasons behind them

The workshop was designed to give parents about 5.5 hours of making experiences which included basics of computer graphic design, 2D design, laser cutting experience, and electronics. We have recently added some programming and e-textiles in the activities. Parents get to make one product each

time. Some product examples are a music box, shelves for jewelry, a lamp, a shopping bag with lights on it, etc. (Link to video of product examples.)

Picture 1. Parents were learning about Arduino lilypad programing in the workshop.

Besides the making experience, activities also help parents get first hand experience of our makerspace in terms of safety rules, how to use each machines and equipment, and how our facilitators work with each maker. There were 2 facilitators working with 10-12 parents. We invite parents to reflect on their learning experiences, sharing feelings and their own learning process.

At the end of the workshop, we have a 1.5 hour reflection and discussion between parents and facilitators reflecting on their learning experiences and thinking about their experiences related to their children. The discussion aims to provide balance between product and process to show them that it is not just the product that we pay attention to. They often comment on the feeling and atmosphere of learning from their observations, and asking questions that they might have are also welcome. Most of the parents connect their experiences to their children. They compare the interactions and expectations that they had before they came to the workshop. Some of these reflections from parents and facilitators are included in the conclusion section.

2. CONCLUSION

2.1 What did parents and facilitators learn from this activity?

During the reflection, facilitators ask parents to reflect on their experiences during the day. We guide parents to review their experiences starting from reviewing all the activities. We ask them to think about 1) Which experience(s) struck you the most during the day? and Why? 2) What happened? How did you feel? 3) What did you learn from those experience(s)? 4) How these experience(s) might connect to your child's learning experience. We encourage parents to choose interesting experiences that struck them—not necessarily the positive ones. We remind them that sometimes negative experiences make us learn even more. Parents are almost always fully engaged with the discussion. Some parents wrote their reflections after the workshop in order to share with other parents. Here are some learning points that I collected from those reflections.

2.1.1 Fear for learning.

"Can I actually do this? I did not have this skill!...I don't know why I should do this. What if it is not successful? It must be very embarrassing." (Anita, parent reflection note, 2019)

Many parents started off with a fear of learning. Many of parents are full-time moms. They have been away from school and hands on experiences for a long time. Some of them had negative experiences with making in their childhood. This workshop makes them encounter their hidden anxiety. Some of them said the only reason that pushed them to the workshop was they want to know how their children learn and what was happening in this learning environment. Many of them doubted experiential education. This was a good opportunity for them to have direct experience and see things with their own eyes.

“I told my husband that I would not attend this class but he convinced me to join. He asked if it’s a good idea to know how my daughter learns? He encouraged me to try and at least take this class just once and see how things go.” (Anita, parent reflection note, 2019)

Picture 2. Parents in the workshop and some examples of the projects.

2.1.2 Talking is much easier than making. Put yourself in their shoes.

Many parents agreed that without this direct experience, it was difficult for them to understand how the children struggled with their own learning. As parents, they had just looked, evaluated, and made judgements. They recognized that they may have made unfair judgements about their children’s work and progress. Execution of new idea takes a lot of time, effort and patience to achieve, and it’s not always going to go according to plan. Usually, it takes a much longer time.

“When I didn’t know how to make things, I complained a lot when I saw my daughter’s work. I thought it looked so easy and I didn’t understand why her work wasn’t completed. I told her that she needed to pay more attention to class. My daughter tried to explain to me about it but I didn’t pay attention to any of her excuses. Then she started to not telling me about classes. (Bell, parent’s reflection note, 2019)

The great thing about direct experience was it put parents in the student’s shoes. They got to see things from the view of a student in FabLearn Lab. They use the same tools and get the same support from the same facilitators. They realize that it is not easy to do simple tasks as a beginner. Sometimes they get stuck with problems that take so much time to solve and so much energy to not give up and keep working under pressure.

“I got to make things similar to my daughter. ... It is very hard to program, to use the laser cutter, to assemble all the parts together, ... to deal with pressure when I was the only one person in class who couldn’t follow the facilitator’s instructions. I realized how hard it is and my daughter might have felt really sad when I judged her. I carried that guilt back home and talked to my daughter that my work was very hard and I apologized to her. It looked simple but it took a lot of patience to accomplish each task. I told her that I’m proud of her.” (Tina, parent’s reflection note, 2018)

2.1.3 Crossing boundaries between parents and facilitators

The feedback from both parents and facilitators showed that both groups gained a better understanding of each other’s role. Parents appreciated the way facilitators provided support to them during the class. That created stronger relationships and trust in the facilitators. Our pilot group of parents also helped facilitators explain the importance of the classes to other parents who may have doubted these classes were useful by sharing their experiences and new understandings gained as a result of the workshop.

Facilitators also gained a better understanding of parents and students. Facilitators reported that they had seen similar learning behaviors between parents and students. This observation helped facilitators

understand students even better. The discussion in the workshop was very open and everyone seemed to care about learning experiences. This is very different from other meetings with parents. In other meetings, facilitators reported that it was much more stressful and there was a lot of talking about expectations towards each other and the child but not a lot about understanding the child.

“I saw each child in their parents and that made me understand my students better. I think this activity made communication with parents much easier because they get to see things by themselves. Reflection discussion was a very good time and conversation between teachers and parents. It felt so much different from regular PTA meeting. That’s from my observation.” (Sandy, Facilitator’s note 2019)

Prof. Sara Lawrence Lightfoot, a sociologist at the Harvard Graduate School of Education and an expert in school culture, writes that the boundary between parents and teachers is hard to cross. We have learned over six years of work that experiential learning for parents can help parents and teachers connect and communicate with each other with empathy. These activities and facilitated discussion can help teachers and parents cross the boundary and constructively impact both parents and teachers gaining new understandings of the children and each other.

2.2 Broader Value

Mutual understanding between family and school is crucial in the development of children. This is especially true for experiential learning because parents might not be familiar with it and distrust it and the teachers who advocate it. It is challenging when parents who grew up with more traditional education are expected to understand modern education or maker education automatically or through limited communication from the school. Parenting capacity development is an important factor of any school’s development. Some schools may choose to set clear boundaries between school and family to avoid any possible conflicts or misunderstanding but it could just be the short term solution that sweeps important issues under the carpet.

Brigid Barron and her colleagues at the Stanford Graduate School of Education (2009) says that parents play an important role in supporting their children in the development of technological fluency. They identified seven roles: teacher, collaborator, resource provider, learning broker, non-technical consultant, employer, and learner. Parent’s Maker Day can be one initiative to bridge the gap between school and home by providing an opportunity for parents to relearn to take on these different roles and learn how experiential learning really works. In this activity, parents get to learn, collaborate, and teach in a different learning environment.

Children naturally absorb things from their environment. Parent’s education and professional development in maker education creates a more sustainable learning environment for students. By addressing parent concerns along with helping them understand a non-traditional teaching style, this helps create a more supportive culture for digital fabrication, making, and constructionism. Parents learn that it is not just the machines but it’s the people and process of interactions to create rich-learning environment in making experience. In our next steps, we have some ideas to involve both children and parents together in family creative learning (Roque, 2016). We would like to bring both parents and children together in the workshop that adults can co-create with children.

3. BIOS

Nalin Tutiyaphuengprasert, senior vice provost of DSIL, a Constructionist school in Bangkok and Managing Director of a social enterprise of Suksapattana Foundation (Thai MIT Alumni Association). Nalin started her work in a Constructionist school in 2001. She has her masters degree in Business Administration in Thailand and another masters degree from the Stanford Graduate School of Education. She has been involved with maker education in Thailand since 2013. She has developed several professional development programs for FabLearn Lab instructors and trained a new generation of facilitators in Thailand since 2016.