DigiLitEY

Short Term Scientific Mission Report

Playful learning in formal and informal learning settings

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This report outlines activities developed during a short term scientific mission (STSM) hosted by Prof. Kristiina Kumpulainen at the Playful Learning Center (PLC), University of Helsinki, between February 11 and March 3, 2017. The purpose of the STSM was (1) to learn about the PLC; (2) exchange knowledge on its role regarding young children's digital literacy practices in formal and informal learning spaces as well as teacher education, and (3) explore possible future collaboration between both institutions/researchers. Information presented is based on document analysis, observation, notes taken during meetings and visits to schools and museums/science centres. Images used are my own. Exceptions are referenced.

The PLC is a living lab or a playground that combines the expertise of researchers, educators, teacher education professionals and trending gaming companies (Kumpulainen & Lipponen, 2014). It is an innovative, technology-enriched play and learning environment that enables the promotion of creativity, co-creation practices, media skills and play-based pedagogies that inform training for teachers and education professionals working in different cultural institutions, such as libraries or museums. It is located at the Department of Teacher Education in the University of Helsinki.

Figure 1. Physical lab at the PLC.

The PLC offers several "playful corners" (Figure 1) that combine different materials, furniture, objects and toys. There is a natural flow among the corners that support engagement in both free and guided playful activities. Its design and decoration are supported by Finnish industries. For instance, Rovio Entertainment Ltd. is beyond the Angry Bird-sceneries used in walls (b and c in Figure 1); Punkaharjun Puutaito Oy is

responsible for the mountain shaped wooden structure and the roll plugs (a and d); Oy Vallila Interior Ab for the fabrics (c in Figure 1) and VM-Carpet Oy for carpets and area rugs, which help define areas (a, c and d in Figure 1). Other companies, such as Samsung provide digital devices, such as LCDs (a in Figure 1), tablets (Figure 2) and video recorders.

Learning opportunities at the PLC may occur as the result of free or guided play, in which case they are infused with curricular content; this is generally taught in a playful manner rather than by direct instruction. At the PLC, teachers are trained to harness playful learning resources in pedagogically sound ways so that children's exploration and learning are enhanced. This may include commenting on children's discoveries, co-playing, asking open-ended questions about what children are finding or exploring the materials in ways that children might not have thought to do.

The PLC has an observation room (Figure 2), which teachers and researchers use to monitor/observe children (and teachers) during play. The PLC also works as a research-based lab, working in close collaboration with teacher education programs of the University of Helsinki, and engaging pre-service and practicing teachers in the research and development activities of the Centre.

Figure 2: Observation room at the PLC.

Work and activities developed are not limited to the physical lab. The Centre is designed to be applied and expanded to other institutions, such as kindergartens, schools, libraries or museums and it had (and currently has) collaborations with some of these institutions.

The PLC has several ongoing projects, such as the FUSE – Makerspaces, STEAM Learning and educational equity, which involves Finnish elementary and secondary schools as well as a science centre. In general terms, the FUSE is an educational makerspace, which seeks to unpack the dynamics between the motivations that young people bring into their maker activities and the demands that these activities pose on their engagement, learning and identity formation. By drawing on ethnographic data, the project addresses long-standing cultural and gender disparities in STEAM fields, and how these can be potentially overcome.

One of the FUSE studios is located at the Siltamäki School. Siltamäki is a primary school with approximately 240 students, located in northern Helsinki. It places strong emphasis in values and skills such as respect, caring, community, humanity and commitment and its learning objectives are determined in accordance with students, parents, school staff and the curriculum. The FUSE studio at this school is a collaborative space of experimentation that allows children to fabricate/build objects and prototypes driven by a "maker attitude", i.e., by a do it yourself (DIY) method: children are encouraged to learn by doing first and reflect/theorize later. The studio is equipped with computers, 3D printers, programmable robot kits, light, lasers and optics science kits and other tech and no tech tools (Figure 3). Challenges are the core activity at FUSE Studios. Each FUSE challenge sequence uses a levelling up model from gaming and is carefully designed to engage children in different STEAM topics and skills sets. Challenge areas include physics, modelling, robotics, electronics, biotechnology, graphic design, fashion design and 3D printing.

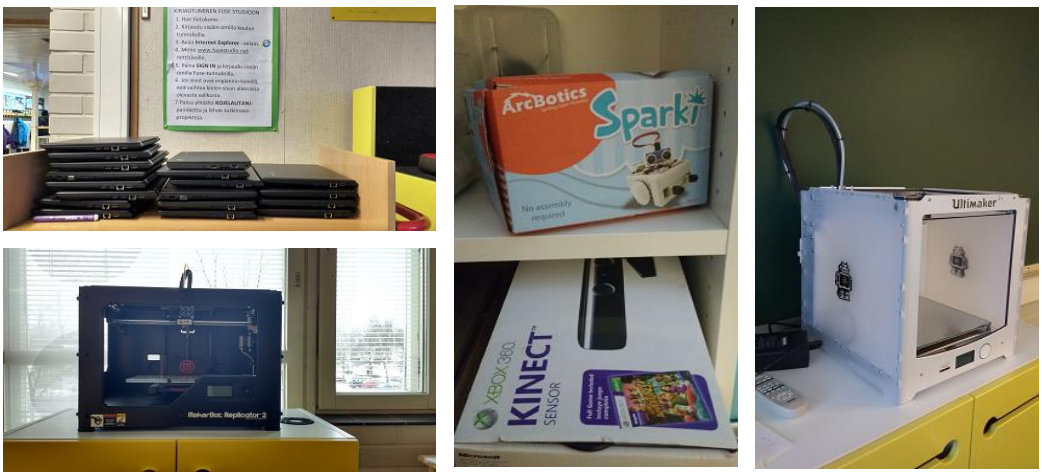

Figure 3. Examples of equipment available at the Siltamäki FUSE studio.

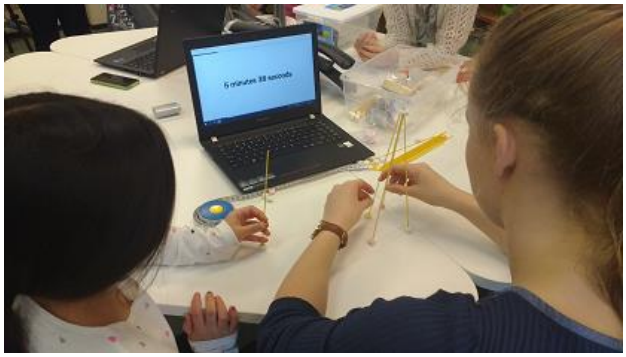

Figure 4: 1st and 2nd grader building a spaghetti tower.

The class I observed at the Fuse studio was a 2nd grade one. The school employs a peer tutoring strategy and as such each 2nd grader was accompanied by his/her 1st grader tutee. Two teachers and a FUSE facilitator were also present. The setting is different from a regular classroom; there is a sofa, a bench with pillows, low and high desks. Children scattered around the studio and after a brief initial conversation with teachers took a laptop and chose the challenges to work on based on what appealed to their interests. Challenges chosen included the Spaghetti structures (Figure 4), which uses pasta and marshmallows as building materials; the Coaster boss (Figure 5), a roller coaster children build using pipe insulation, tape, chairs, desks, benches and walls; and the Cookie customizer, which children design and print (Figure 6). Each challenge includes different levels. In order to level up, children need to take a picture and upload it to their personal FUSE studio account; the resulting digital media artifact is shared for peer review, remixing, expert feedback and collaboration. Levelling up is also registered on "an expert wall" in the studio. The number of levels achieved is identified by emoticons placed in front of children's name. During challenges, the teachers and the facilitator encouraged children to create, reflect on, and refine artifacts as they progressed through assignments. Children were persistent, creative in solving challenges and they had fun while doing it. The class was video recorded for later data analysis within the FUSE project.

Figure 5: Coaster boss challenge.

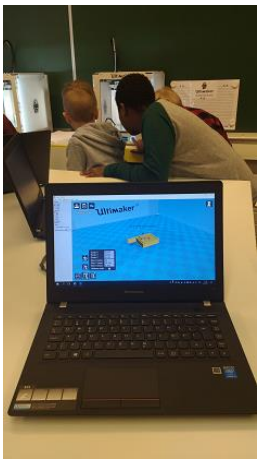

Figure 6: Cookie customizer challenge.

Collaboration with other institutions, such as museums, is also common within the activities of the PLC. 'The Magic Carpet of the Technology Tales' project run by the Museum of Technology (Tekniikan Museo) encouraged pre-school and early primary education stages children to observe, experiment, understand, use and develop technology in their own living environment (Kumpulainen, Karttunen, Juurola & Mikkola, 2014). The goal was that learning new things took place through playing, collaborative creativity and experiences at the Tekniikan Museo environment. The project entailed a workshop, whose activities took place on the Magic Carpet. The Magic Carpet (Figure 7), which is mobile, i.e., it can be easily used for sessions taking place not only at the museum, but also at a school or any similar environment, is an oval textile carpet made up of cloths of different colours textures and patterns and attached to it are decorations in many colours and materials.

Figure 7: The Magic Carpet.

Figure 8: Phones of different ages.

The activity objects include different kinds of technology that reflect its applications and technological change (Figure 4[1]). The patterns on the Magic Carpet are trigger images for augmented reality that appears on a mobile device (Figure 5[2]). Activities are usually studied using a range of data collection techniques, which include participatory observations, photography sessions, video recordings of the children's and adults' activities and interactions, interviews (children) and surveys (teachers). At present, workshops with the Magic Carpet are not taking place. The project manager and her team are rethinking the inclusion of new technologies and activities so that current expectations from children and teachers, as well as curriculum demands, are met. While visiting the Tekniikan Museo, it was also possible to observe a Bee-Bot workshop for children aged 5-8. Five children attended the workshop and all were accompanied by their grandparents. After a short introductory activity, children started experimenting with it following simple instructions provided by the workshop facilitator. The next activities with the Bee-Bot included navigating a map, an obstacle course, meeting characters following a given sequence and spelling out words using letters on the floor. Children were free to choose activities and experiment them all. They were encouraged to participate in every stage of the workshop and develop their problem-solving skills as they were left to discover for themselves what worked well. Only then, did children use the tablet to programming it.

Figure 9: Tablet usage for augmented reality.

Figure 10: Bee-Bot workshop.

During the STSM I engaged in several informal meetings with my host and other researchers. I had the opportunity to present the CIDTFF, its research groups and interests. Particular focus was placed on Research Group 3 - Communication, media, digital and virtual environments in education -, which focuses on the research and development of innovative approaches in teaching and learning processes and on the promotion of science and scientific literacy in formal and non-formal educational contexts, in a lifelong learning perspective. Focus was also placed upon research projects being conducted, such as the ENAbLE and the EduPARK projects. In another meeting, a brainstorming activity took place regarding the topic

[1] Retrieved from https://pientenpaja.files.wordpress.com/2013/12/2013-04-22-14-59-29.jpg
2 Retrieved from https://pientenpaja.files.wordpress.com/2015/01/2015-01-09-11-25-52.png

"multiliteracies". Different types of literacies and means to address them in early education were explored and discussed. During another meeting, a visit to the Media Lab at the Aalto University was suggested and arranged by Prof. Kristiina. Prof. Teemu Leinonen welcomed me at the Media Lab and presented some of the research projects they conducted recently and are currently conducting. I got acquainted with the Square1 project, which is a self-organized learning environment built by children at schools to support progressive inquiry; and with Feeler, a prototype based on real-time data monitoring that seeks to foster awareness and reflection in learning by visualizing learning performance and well-being. Different possibilities for future collaboration were discussed during these meetings as many research interests are common. These may include co-authoring publications or partnering research projects.

References

Kumpulainen, K., Karttunen, M., Juurola, L., & Mikkola, A. (2014). Towards children's creative museum engagement and collaborative sense-making. *Digital Creativity, 25*(3), pp. 233-246.

Kumpulainen, K., & Lipponen, L. (2014). Playful solutions for lifelong learning. *European Lifelong Learning Magazine, 4*. Retrieved from http://www.elmmagazine.eu/articles/playful-solutions-for-lifelong-learning