Descriptions of children play with iPads in two case studies

Group of 2-year-olds (2020)
Preschool in a multilingual settings where digital tools have been added due to the curricular requirement, but also as a way of working with the multiple languages represented at the preschool.

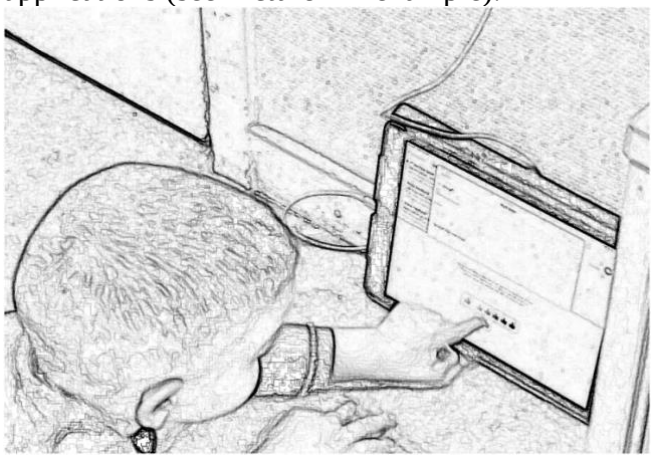
The municipality spent a considerable amount of resources to buy iPad to the whole group of preschools in the area. Every group received 2-3 iPad, where one is designated to be used by the teachers, for administrative tasks or planned activities with the children. Also, 1-2 iPads per group was termed the "children's iPad", with the purpose of being used more liberally by the children. This allowed the iPad to be carried around the preschool by the children and to be featured in different sorts of play and spontaneous activities by children with or without their teachers present.

Group with 4-5 year-olds (2015)

The preschool featuring the older group of children had a different set of rules from the preschool with the younger group. While the municipality also had spent resources to have 1 or 2 iPad for every group at the preschool. The children and teachers more often shared one iPad. This is also reflected in a more cautionary set of rules regarding the iPad. The children were allowed to use it under less supervised conditions, but only if seated at a children's table, or sometimes at a mat where the iPad was used by teacher's during circle time.

Solitary free play
2-year-olds
The 2-years olds use various types of touch actions – presses, swipes, dragging – to navigate around the interactive applications. This can be seen as a type of object play; however, due to the application used, the object is changing due to the touch actions that the children use.

The play is mostly explorative in character, the children often navigate around the menus. This type of exploratory play is seen in all of the range of functions that the tablet offers. Children navigate around the menus, and for example open word processors or email applications (see Picture 1 + example).

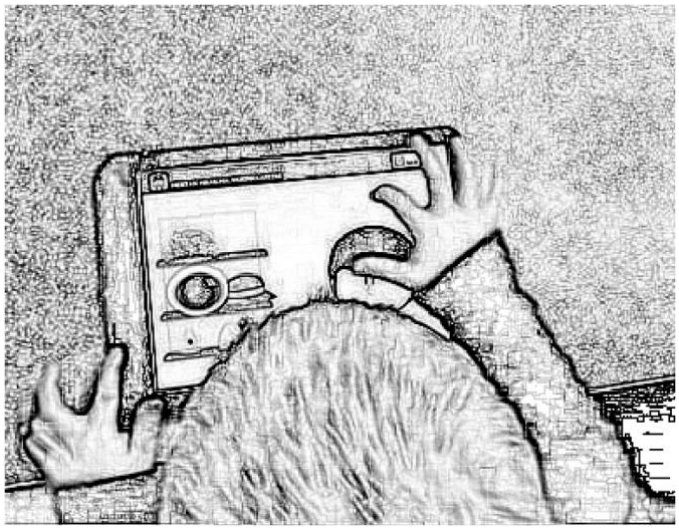


Picture 1

The child in picture 1 has found an iPad that is charging and standing against a wall. Incidentally, this is not the 'children's iPad', but the teachers. Opening it, the child finds the email application. He starts writing letters, seemingly at random. But later tries an on-screen button that opens a range of emoji symbols. With seemingly great interest, he browses through sets of emoji's with a swiping motion, presses the ones he fancies and thus 'writes' with emoji symbols.

4-5 year-olds

The group of older children are playing with the iPad under a different set of rules. Children are almost exclusively seated at the table. Children often take turns to finish a game or to work with an interactive story on the iPad. The children often finish a level of a game or go through one of the interactive stories before ending the task or letting another child take over or join in. On some occasions, an hourglass of 5 minutes is used to indicate when a child is supposed to leave his/her turn.



Picture 2.

The child in picture 2 is playing an interactive story game. He has to dress the character for another level where the character is walked through the woods using a tapping motion. First, he finishes the dressing task by dragging the clothes to the right body parts. When the wood level opens up, he succinctly taps the left and right buttons featuring shoes to walk the character through the level. He then gives up the iPad and goes over with it to a child sitting at the corner of the table, who's next in turn. The two levels of the game are finished in around 4,5 minutes.

It is common that a child will finish a level or an interactive story in the manner of the example. This makes the older children's play less explorative in character and more about skill acquisition of the game components needed to clear levels.

Cooperative play
2-year-olds

The younger group had a lot of more freedom of movement and placement when playing with the iPad. This led to interesting types of scenarios where several children can sit around the

iPad from several directions and play in ways that may not be intended by designers, as children can tap the surface from all sides of the iPad.

Picture 3

In Picture 3, three children are playing with and navigating around an open-world interactive game. Children can move around in the game using swiping motions and enter different places using tapping or pressing.

At a first glance, the sequence looks like haphazardly pressing and swiping from the children. It is hard to grasp as it goes fast – a total of 42 actions to the board per minute – 0,7 touch actions per second. After observing the sequence at a slower pace and annotating the actions in ELAN, it is however clear that the children synchronize their movements in interaction with each other. The different touch actions from the children are seen in the annotated sequence is in Picture 4

Picture 4

In the beginning of the sequence, we can see that the children sometimes press the screen simultaneously. This is quickly realized to not be a successful strategy as the presses not are effective with three children pressing at once, due to hardware and/or software limitations. After the initial synchronization, we can see how children start taking turns pressing fast, but also rhythmically, the children press the screen in synchrony – allowing them no navigate to different spaces in the virtual setting on the screen together.

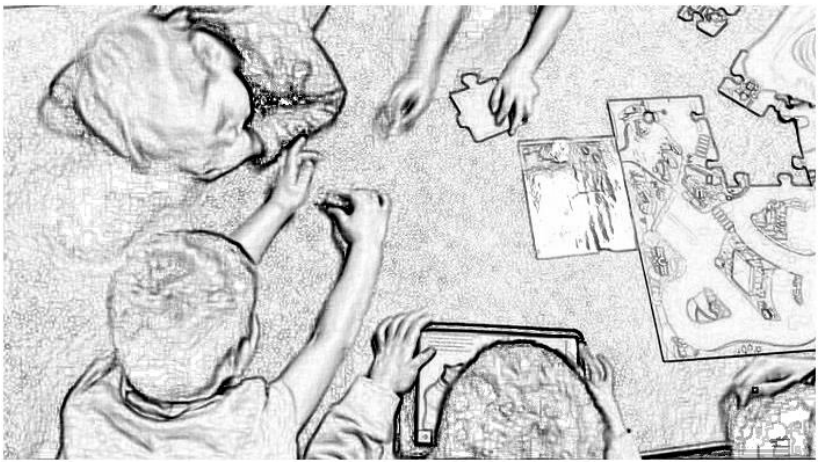
This type of cooperative exploration is afforded by the open-ended game and the type of rules surrounding the iPad at this preschool. The children are allowed to use the iPad in their play and move it around according to their will. This leads up to this type of arrangement, where the children can sit around the iPad and cooperate around it in this way. The children are observed doing this with even up to four children around the iPad at once.

Some applications allow more touch actions at once. In these cases, children grasp this affordance and will simultaneously use the interface in a joint way, rather than the turn-taking

manner seen above. There is thus a relation between the affordances of applications and the type of interaction and play that children enact.

4-5 year-olds

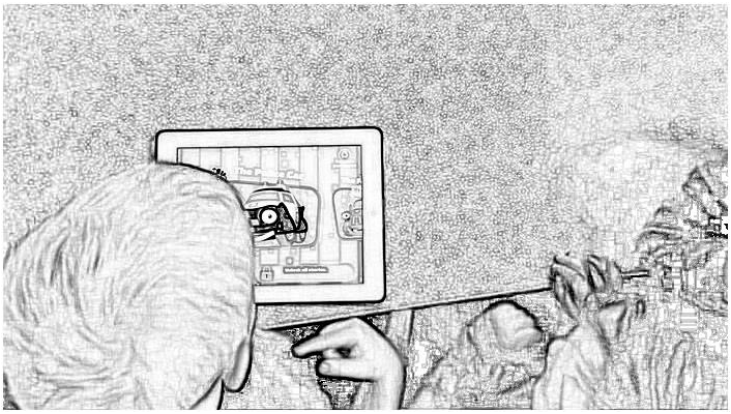
With the older group of children, cooperative play with the iPad is less common. Children are often seen waiting for their turn, often beside the child whose turn it is to play, but without interacting with the child playing.



Picture 5. Waiting for one's turn.

In Picture 5, a child is playing with an interactive story on the iPad. Three children are in line to play a game of their choice for 5 minutes each. One of the children is building a puzzle to pass the time. Another child starts playing with two pieces of LEGO in the meantime, which captures the third child's attention, who starts to imagine and question what it could be.

While the children spend less time cooperating on the iPad, there are instances of organization around the iPad. The children keep record of the other children's turns. In Picture 6, a child is delegating the order of turns to the children who are waiting in line to play with the iPad.



Picture 6. *Child: "First its* ***my turn****, then Sam's, then Johnny's"*

Even if they are few, there are some instances of cooperation around the iPad. This seems to arise when children are in a more exploratory mode, as when opening a new applications, and using new features. In Picture 7, a child using the iPad choose an application that seem novel to the children. As the application opens up, it advises the user to turn the iPad. The child sitting at the opposite side of the user, says that he 'knows how this is done' and the children try to turn the iPad together to get ahead in the game.

Picture 7. Turning the iPad together.

This group of children with children 4-5 are otherwise heavily into pretend play. Children dress up for role-playing games, play store, and can have sessions of make-believe play for hours, if not interrupted. There a few instances of this type of pretend play with the ipads, but some instances that can be seen as cursory make-belief between the children. For instance, in Picture 8 a child sitting across from the child operating the iPad spots an application featuring 'monstertrucks', while the operating child chose another application.

Picture 8
*Child: Did you see the monstertruck? It can jump like *show a gesture of jumping moving his hand and arm across the table**

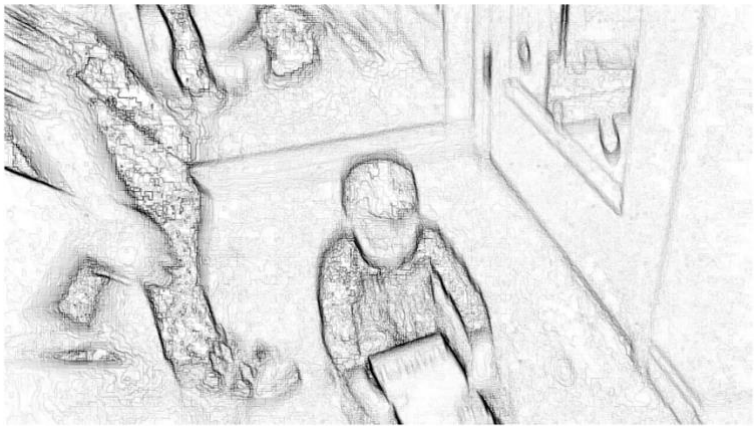
Sometimes the children would point to characters, in a cursory role-play – 'Oh I want to be that one!' However, the bouts of pretension does not lead to anymore in these instances. The children do play with other types of characters and themes from popular culture taken from these series. However, at the sessions of iPad use there is no more pretension, role-play or make-belief observed.

iPad play with adults

2-year-olds
With the younger group of children, there is significantly more involvement from the teachers during children play with iPad. As inclined with the more liberal set of rules regarding iPad

use at the preschool, the children sometimes request the iPad when playing or doing other activities with teachers.

If children get stuck during free play with iPads, children routinely request help by poking the attention of nearby adults, exemplified in Picture 9.

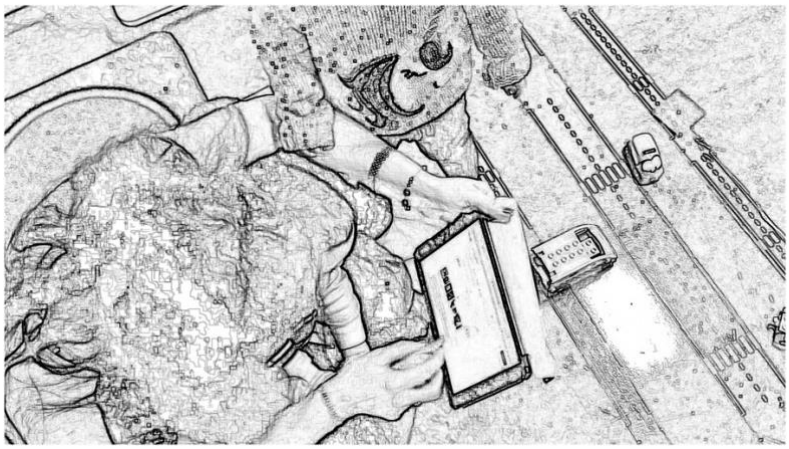


*Picture 9. Boy: I want that one *points to a character at the screen**

In Picture 9 a child has been trying to navigate to applications featuring a popular children's show. However, instead of opening the application he has entered a webpage with pictures of the same characters. Now, when pressing the characters, nothing seemingly happens, as it would in the application. When repeated pressing does not work – the boy seeks the attention of a nearby teacher – 'I want that one' – as he points to the character and he gets help finding the correct application.

While the younger children are indeed very adept at navigating on the iPad using various types of touch movements, recognize and use its on-screen symbols – still there are some form of moves and navigational difficulties that are hard for the children. One example is when using the camera, or in applications that utilize the camera. The children sometimes manage this, but there it is sometimes difficult to hold the iPad, point it to object being photographed and at the same time press the button, which becomes located at the middle of the side of the screen.

There are other occasions where scaffolding for children is presented. The teachers are at times seen sitting with the children during iPad use. In this way the use becomes a joint activity where teachers can name things on display for the children, point to object of interest and also press things on screen together. When children have trouble navigating, teachers take children's hand and guide them in the movement required by the application. This is shown in Picture 10.



In Picture 10, this movement of guiding a child's hand into a press is shown. The teachers first say where the child is supposed to press, and when aids the hand into a firm press at the right button on the screen.

Children and teachers are often sitting jointly using the iPad like this in the case preschool with the younger children. The constellation of children and adults sitting together is very much like a shared book-reading interaction. With one or two children are sitting beside or in the lap of a teacher and while facing the object of attention together (iPad or a book). There are various important aspects of this type of posturing, as both children and adults are direct at the screen, communication and touch movements goes together and teachers can scaffold children both verbally and as in the case here physically.

Thus sitting in this type of way and doing things together on the iPad allow teachers to both aids the children if they need help with touch movement, but also to provide scaffolding in regards to the content of the applications on screen. The teachers are seen naming things, asking questions and relating what is shown on-screen.

4-5 year-olds

With the older group, there is not only less interaction between children while using the iPad, but also little interaction with the teachers. The interaction with teachers during play is almost exclusively in regards to turn-taking. The adults prompt children when their turn is up. Sometimes the children ask the teachers the order of turn or how much time is left.

There is very limited interaction about the applications themselves that children are playing with. Sometimes an adult will tell children that they are using applications that there are not allowed – as when children have entered the Appstore – in fear that children will buy applications or interact with inappropriate content.

There are no instances in the data of the type of sitting together or using guided touch that was seen in the case report from the younger children. Using the iPad is rather something that is done without teacher interference at this preschool. The children are also very adept at using many of the applications available in the preschool iPad, and thus, teachers might view it as 'unnecessary' to interrupt the children when they are playing the games and stories themselves.