When is a student-centered, technology supported learning a success?

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ABSTRACT

The iPad as a learning tool has made its way into many elementary school classrooms worldwide. It holds a promise to be a game changer in elementary school education supporting more constructivist learning practices. This paper offers an insight into what happened when, in two elementary school classrooms, the students were enabled to generate both content and context for their own learning. One of the cases describes how the 5th grade children influenced their teacher and obtained permission to use one of the iPad's creativity apps over a two-week period in order to learn about writing. The second case is about 6th graders involvement in a participatory design process aiming to design an application for the iPad. The application was to support learning about media production by enabling students to publish a weekly newsletter describing their school week in words, pictures and video. The children participating in the studies evaluated the projects as truly successful. The children's criteria of success were how cool, fun and enjoyable it was to use the iPad. The teachers did not find the projects to be successful. The main criterion they used was the learning outcome. Both teachers found the learning outcome to be inferior to what they usually obtain using traditional teaching methods. Both teachers preferred to use the iPad as a plug-on to traditional ways of teaching. Although our study is small, the results point towards important issues, such as the evaluation process and the decision making process, that may have large influence on the use of technology in the classroom.

KEYWORDS

iPad, classroom ecology, multimodality, cool technology, group learning, design with children.

1 INTRODUCTION

In the field of educational technology acceptance (see, for example, [1]) efforts are made to identify, describe or quantify factors that hinder or facilitate easier acceptance of new technology into the classroom ecology. Many researchers, educators and even students see that the digital technology does not work in the ways they envision [2]. However, in many cases there may be ways to enable new digital technologies to function better in the classroom's eco-system. We hope that this paper would bring forth some of the invisible, but strongly influential processes, such as decisions around what is to be achieved using the new technology, or how much power students really have in a student-centered learning situation to decide

when and how to use the new technology, or other learning tools or methods.

The iPad has been used as a classroom digital technology in our case. The iPad has been seen by many [3] as a tool that may change learning towards more constructivist learning practices with larger autonomy for a student to decide on where, when and how to do their work. Even though the iPad was not a product designed specifically for education, it could be used to support it. In fact, more than support was expected from it. A lot of media attention was focused on iPad-centered education (see, for example, [4, 5, 6]). Large numbers of educational institutions took the iPad into use [7]. They could connect with each other through The iPads in Education Initiative [6], follow iPad education on Twitter (iPadEd), and participate in social media dedicated to improving education through iPad use etc. Apple picked up on this tremendous interest and introduced a variety of services such as iTunes U, iBookstore, iBook Author publishing tool and is now marketing interactive multi-touch textbooks [5] under the slogan: "*The device that changed everything is now changing the classroom*" [8]. A series of other accompanying products, such as racks that can hold multiple iPads with chargers, connectors to other classroom devices etc. support the use of the iPad in the classroom. In addition to the perception that the iPad is a cool mobile device easy to use, all the above-mentioned forums, services and products are making it into a more desirable learning tool.

In this paper we discuss the iPad as a learning tool for the tween population (children between 8 and 12 years old). No piece of technology that the tweens desire to use can be seen in isolation from their culture. The tweens care about technology and in particular, about cool technology such as the iPad [9,10]. The coolness of the iPad is partly due to its sleek design and partly to possibilities it offers for doing enjoyable things with it. It is about mobility, connectedness, communication, social networks and collaboration. In [11] Wells says about tweens: "*They are learning in entirely new ways, and they will mature with constantly evolving educational system. They'll be the first to use more electronic tools (computers, e-learning software and touch-screen test taking) in the classroom than traditional ones like pen and paper. All of these new tools allow the tweens to learn faster than the generation before them.*" If this is so, could collaborative learning through productivity supported by the iPad give not only faster but better learning? Can we say something about learning outcomes and how they change as a consequence of engaging students in production rather than consumption on the tablet? Of particular interest are situations where the students are allowed to change the traditional learning styles and practices and are given the power to decide on tools that they want to use for a specific project.

We started unfolding these questions by studying the use of the iPad in two cases of such collaborative, production based learning. The first case shows how children's enthusiasm around one particular storytelling app they thought was very engaging, the Puppet Pals, motivated them to seek permission from the teacher to use the app in order to learn about storytelling. The composition writing was already part of their teaching plan. Without the iPad, this would have been done in a

traditional way through a series of writing exercises. With Puppet Pals, the writing was closer in style to writing a script for a play than a story. The fun was much in the fact that the app engaged multiple senses (touch, sound, vision) in an easy to master storytelling process. The outcome of the process is a short animated video. The second case is about children's involvement in an iPad app design process. The app was to enable them to learn about media production. The goal was to have the students participate in the design process and though this participation gain mastery of the application. The class decided to focus on making a weekly newsletter using words, pictures and video. Thus in both cases, children were working with multiple modalities (images, audio, video and text).

These two cases were part of larger studies following the introduction of the iPad (the first iPad) into two Norwegian elementary schools. One study was conducted over the whole year (2011) and the second study through the fall semester of 2011 (August - December). Even though Norway has a high standard of living, there were noticeable life style differences between the children going to these schools. One of the schools was in the provincial part of the country. Only 2 of 26 children in the participating class had an iPad at home at the start of the study. The second school was an urban school in a prosperous neighbourhood, where all but one of 19 children had an iPad at home. (In August of 2011, when the urban study started, 6 additional iPads were purchased by the families of children from the provincial school). Additionally, most of the children from the urban school had an iPad 2 at home, and "only" an iPad 1 at school. Many of them owned an iPhone.

One child had, in addition to an iPad 2, a Mac air, and an iPhone. These urban kids were indeed representatives of global mobiles population Wells [11] describes. For them, technology is an integral part of life and not a privilege. The Internet is expected to be available everywhere [12]. These expectations are not always met. In our study, the provincial school did not have a wireless network in the classroom, and students at this school often could not afford the latest technology. The urban school did have a wireless network in the classroom and children, in terms of their attitudes, possessions and expectations were to a much larger degree as described in [11].

The approach and methods we used in these two studies were different. The 5th grade children from the provincial school participated in one-year-long study on adoption of the iPad into classroom ecology. The two-week period of working with the iPad as a learning tool enabling students to define the tools and the context for their work, took place towards the end of the first semester of study, in May 2011. The methods we used were observations, interviews with children and the teacher and participation in presentation session when students showed their work. In the case of app design, a group of three computer science students chose, as their semester-long project in interaction design, to help the children design an app. The children participated in the design process in the role of users, testers and informants to design [13]. Focus groups and workshops were organized in order to solicit children's input to design, as well as to choose among alternative design possibilities. Simple surveys were used to collect some quantitative data, mostly about

children's preferences for styles and design elements.

These two cases of children's creative engagement with the iPad emerged as the most interesting moments in these longer studies. The most important finding from the cases described below, was the difference in the quality of experience between the children and their teachers related to the projects. The children participating in the studies evaluated the projects as truly successful. The children's criteria of success were how cool, fun and enjoyable it was to use the iPad, to work in teams anywhere (not only in the classroom) and try something new.

The teachers did not find the projects to be successful. The main criterion they used was the learning outcome. Both teachers found the learning outcome to be inferior to what they usually experience when using traditional learning styles. This perception that the learning outcome was weaker than usual had consequences on the further use of the iPad as a learning tool for both participating classes.

It is perhaps interesting to mention that the evaluation by teachers happened to be very much along the lines of what Cuban said [7]: "*iPads are marvellous tools to engage kids, but then the novelty wears off and you get into hard-core issues of teaching and learning*".

In a larger technologies in education context, Selwyn [14] talks about looking beyond the hype of schools and new technologies: "*The long standing and wide-spread faith in the ability of digital technologies to remediate and even transform schools must be seen in wider societal concerns over mass schooling. ... The past three decades have seen the regular advancements of arguments, for example, that individuals can learn*

through the 'hard fun' of creating and playing computer games...". Thus, looking into decisions, explicit or implicit, as to when the children engage with projects that can be described as fun, engaging etc, and what happens when the projects are over in terms of evaluating the learning outcomes, we look into what comprised the "hard learning" for teachers in the study and what terms such as cool, fun, and engaging meant in terms of learning for the children.

The paper is structured as follows: in section 2, we describe the case of using the Puppet Pals to learn about writing; in section 3 we describe the app co-design process. This is followed by discussion of findings in section 4 and conclusion.

2 STORYTELLING AND PUPPET PALS

The 5th grade children were introduced to Puppet Pals as one of the iPad apps we chose to work with in a context of a storytelling workshop, Figure 1 and [15]. Storytelling was part of the curriculum at the time of the workshop. Five different modalities of making stories were chosen. Two of them were using the iPad applications Puppet Pals and Animation HD. These were chosen because they offer different ways of creating: in Animations, one still has to do free hand drawing, while in Puppet Pals one uses readymade characters shifting the focus onto the story itself. The remaining three ways of creating stories were not iPad related: one was based on paper with lots of colour pencils, one on 3D origami-like shapes that the children have helped design (on a different occasion) and the last one on the iPhone application, StoryKit ([16]), designed with children for story making.

For the Puppet Pals part of the workshop, we ran a pilot with children outside of the participating class, aged 7, 10 and 11.

Figure 1. Storytelling workshop where the children are using HD animate and Puppet Pals apps on their iPads, as well as some modes of storytelling that do not require technology.

The chi tested the ease of use of the application itself as well as helped us with finding themes and characters to use in the workshop. The Puppet Pals application was found to be easy to use for all three participants. While text could not be used, the application allows for voice recording. Producing little animated stories was literarily at the fingertips. Equipped with themes from the far north, troll characters, polar bears as well as traditional characters such as Hansel and Grete, we were ready for the storytelling workshop with the 5th grade. The children enjoyed creating stories with this app, and everyone managed to make at least one short story. The prepared themes and characters ended up being very little used. The children preferred to find images on the net or use their own, as inspired at the moment. After the workshop, the smart board was used to show some of the stories made. The children loved watching each other's stories; the classroom was full of laughter and encore requests.

The aftermath of this workshop was that the children spontaneously started making more and more stories at home and within a week, there were over 50 short Puppet Pals animated stories on their iPads. After that, it was easy for children to talk to their teacher and convince her to use the iPad for learning about writing. The traditional writing exercises were replaced by Puppet Pals story production. The plan was simple: during the next two weeks, the children were to work in groups of two and make a short story. In the first phase of the story development they were to use iThoughts to make a plan for the story: decide on storyline, characters and locations. Then they needed to develop the script, write it down, carefully developing the dramatic moments, practice it and test properly before recording. The basics of writing a good story were thought in a usual manner, with lectures. After each lecture some time was left for their iPad project work. Thus the iPads were used for some of the class time, but the rest was to be done at home, as a homework assignment.

Some technical problems with iPads occurred just at the end of the time allocated for the projects. Some groups could not get the sound to work and one group of students could not convert their story to a video. The iPads were tested prior to the project start and the app was up to date on all devices. The children had to wait for an available iPad and there was some fear that they would not be done in time. Yet another technical problem arose during presentations: one group could not get their video to play. Immediately following the project presentations, 6 children and the teacher were interviewed individually. All the

children were really pleased with the project results. They said that working in teams was fun, that the iPads were cool to work with, that it was cool that they could use them in other settings besides the classroom. The sitting arrangement when working with iPads differed from the usual 2 students per desk setting.

The teacher remarked that the process was overwhelming for children and unconstrained. *"They were all over the place",* she said. Given too many alternatives, the children did not manage to master the story line. It was too much play and too little structured work and learning. Compared to previous years and usual writing projects, the teacher found this year's results to be inferior. Reflecting upon what she could do to change this outcome if she was to repeat the experience of teaching using the iPad in a similar way, better planning and structuring of children's work were on the top of her list.

As observers during the final presentations, we could understand the teacher's perspective. The stories were not always complex or coherent. However, the children had to deal with introduction of moving images and sound, as well as a new understanding of the continuity in the story based on multimodal input. Additionally, this kind of production has other important aspects with respect to learning: it is happening through cooperation, sharing and giving possibility for children at all learning levels to participate.

3 CO-DESINGNING A NEWS LETTER

The 6th grade children from the urban school were thrilled that they were chosen to participate in the pilot. The class got six iPads to use. As mentioned earlier, all but one child had an iPad available at home and the teacher could draw on this resource when more iPads were needed for specific tasks during the semester. Parents were very supportive of the project and it even appeared in the media (see [17], Figure 2 and Figure 3 are used from the article, with author's permission).

A group of three university students (see Figure 3) taking a course in interaction design, chose, as their semester-long project [18], to engage the children in an app design process. The app could be used to learn about media production, while the process of making the app was to teach them about design.

Figure 2. The 6th graders and their teacher, working with iPads. Photo: Anders Hofseth, NRKbeta CC BY 2011.

After an initial interview with the teacher and a focus group with children, the decision was made to make an app that would enable the children to produce weekly multimedia newsletter, involving text, images, video and sound. The children were to be included in the design process from the start. After the decision on what was to be designed was made, basic requirements were discussed with children and formative user testing was conducted. The children played the dual role of both testers and informants to design (see [13] on

different roles children can play in the design process).

Figure 3. Interaction design students [18] waiting in front of the classroom to show progress on the app. Photo: Anders Hofseth, NRK beta CC BY 2011.

The children were divided into five groups and assigned different design tasks. Two of the groups worked on the paper prototype of the application and the tool box kit and 3 groups worked on the design of the icons, colours, space layout etc. Figure 4 shows an early iPad prototype. The user could, in the stage depicted in Figure 4, create a blank document or edit an existing one.

As is often the case, app implementation took longer than anticipated. Thus little time was left for actual use and evaluation of the app. None the less, a few bugs were found. The worst one of these was that scaling images or text down could cause the entire work to disappear. Some students have lost their work in this way. In fact, one of the interviewed groups told us that they lost their work as they were walking from their desk towards the teacher to show what they have done. One of them wanted to fix one last thing when suddenly their work vanished.

Some children expressed regret that they could not see even more of their suggestions adopted.
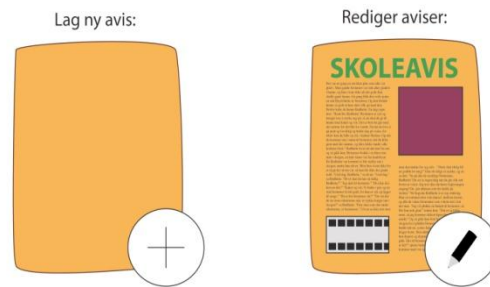

Figure 4. The prototypes for the newsletter from [18]: to the left, interface for inserting a new document and to the right interface for editing the existing paper.

The two girls interviewed here were part of the icon-design team:

Girl 1: *Actually, if that school paper app worked well, that would have been really good.*

Interviewer: *How did students involve you in helping them make the app?*

Girl 2: *They asked what we wanted. We could choose between pallets and wheels, for example. We chose pallets and made a whole bunch of those. That was actually a bit cheap; they were all erased in the end. They also asked us about the choice of colors, look* (they show the app) *how easily one can change the background color for the newspaper.*

Girl 1: *They also asked about how the videos will look like, painting etc.*

Interviewer: *You mean the icons?*

Girl 2: *Yes, they asked if something could be done better.*

Interviewer: *Could you come up with your own suggestions?*

Girl 2: *Yes, we could have our own suggestions and so they would try to make it work like that. They were very kind and wanted us to tell honestly what we thought about it. We had to fill papers with questions, too.*

The examples of work that the children produced using the application were much simpler that envisioned.
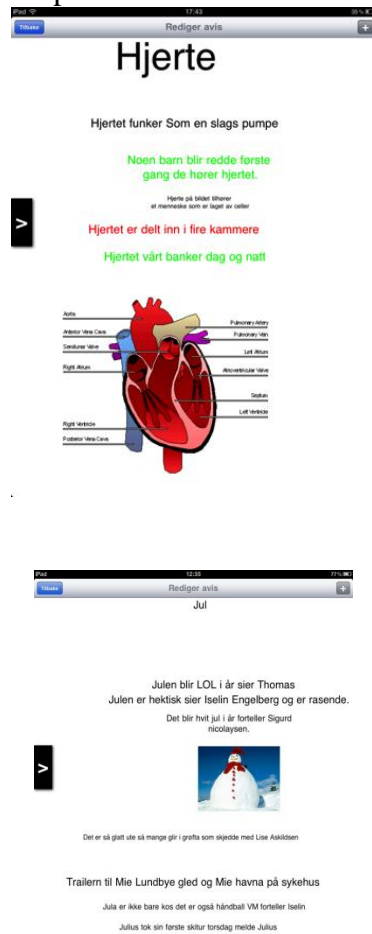

Figure 5. examples of the newsletters. The top one shows what the children learned about the human heart, short text written by different children. The bottom one quotes what different children in class think about Christmas.

Figure 5 shows two examples of a newsletter that the children made. Tapping on the arrow in Figure 5, opens the palette with icons shown in Figure 6. As can be seen in Figure 5, no videos were made or included. To use the camera or phone to film and then to transfer the films to the iPad was too difficult. The iPad 2 could have helped resolve this problem, but the class had the first version of the tablet.

At the end of the semester we had a second round of interviews with five of children from the class and their teacher.

Figure 6. The final palette with icons. The children helped in the design of these.

We found out that the use of the iPad in the classroom was nearly entirely reduced to work with interaction design students. The use in the classroom was minimal.

When it came to production work and the usage of the app, the teacher meant only a bug free version could be useful. The iPad 2 would have been a better choice for the platform, he thought.

A larger problem, from the teacher's perspective, was that output the students produced was not of high quality. Partially, the technology and bugs in the programming could be blamed. The bigger part of the problem, he continued, was that the students would need much more guidance in order to produce better quality work. This could require additional resources such as time and perhaps assistance.

The children did not really get to understand how the app was made, neither in terms of code nor in terms of design. We were hoping that this kind of learning would also be a part of the app making experience. However, the children did participate in the project eagerly. They did their best to provide ideas, suggestions and help in making the design choices, but often they did not understand the implications of certain choices. Thus, we wished we had more time for this project.

Another source of frustration was the fact that they could not connect their

iPads directly to the smart board. The reason was simple; they lacked the right type of connector. One of the interviewed girls said: "*We made a newsletter and wanted to show it to all sixth graders, but we did not have the cable* (note: VGA connector), *so we could not. If we had* (owned) *the iPads, we could search the Wikipedia and find the cable. Then we could use the money from the class fund to pay for it.*"

It is much more at stake here than simply a connector. It is cool to show off, as this class was the only one at school having the iPads, children say. Showing their work to other 6th grade classes would have been a motivating factor for doing their best. The children of course, did not purchase the connector. But their enthusiasm for the project was reduced. A bit more enthusiasm for creative work with school iPads went away as many of them had the iPad2 at home, the iPad 2 certainly a better choice for this particular project and easier to use in content production for the app (using built in camera for images or movies which could then be edited with iMovies). The iPads 2 could not be used as the prototype of the app was installed on the school iPads only. Therefore, the largest gain from this app designing project was in the design process itself, which the children evaluated to be very fun, entertaining and engaging. What they did not like about the design process was that very few of their suggestions remained as part of the final design. All of the interviewed children said that they would love to do this kind of work again. We did not ask the teacher this question explicitly as his answer to the question if he would like to continue using the iPad in the classroom was: *I would not be uninterested. But if I could choose, I would choose laptops. It would be, though, OK to have a set of iPads for classroom use as well.* In essence, even if he did not use negative words, the teacher was saying that the iPad, the app and the work on the newsletter have not quite met his needs or satisfied his goals in terms of the learning effect.

4 DISCUSSION

For the 6th graders, making a school paper was the only creative activity they have done with the iPad during the entire duration of the study. It is interesting that they have started the pilot study very enthusiastic about the iPads. They enjoyed participating in the project and being part of the design process. In the final round of interviews they were very positive towards the use of the iPad. They all said that it was great to have the iPads, that they are really cool. The iPad 2 was better, though, the students told us. However, they loved the fact that they were the only class at school using the iPads. From their answers to more focused questions about the use of the iPad, we could only conclude that they were barely used in day-to-day teaching and learning.

For the 5th graders, iPads were used more extensively and for the range of purposes: to access digitalized curriculum, to show the content from the iPad on the smart board and accessing the Internet. This class has also used certain educational apps from the Apple store to supplement the teaching.

The Puppet Pals experiment in writing and the design of the newsletter app were the only examples of children's production rather than consumption of the content on the iPad, giving us insight into how the iPad might serve as a

catalyst for establishing a more constructivist learning practices. The knowledge construction in these examples took place trough collaboration and opened up for the possibility of greater autonomy for the children to influence the choice of tools, content and context for learning.

Based on the teacher's previous experience, greater autonomy and new technology have given inferior results in terms of learning outcome. On the other hand, rethinking the pedagogical approach is necessary in order to take into account new issues like multimodal interactions, interactions between students and the content they are learning about using the tablet.

The children and their teachers expressed also different views on the desirability of similar use of the iPad in the future: while the children felt that they would definitely repeat the experience, both teachers, while not closed to the idea, prefer other solutions (laptop over the iPad in general in one case, traditional paper writing in the other).

Trying to understand this difference in views between the teachers and the children, we analysed our data base consisting of many photos of children working, screen captures, videos, newsletters stored on the iPads, 4 interviews with the two teachers and interviews with children. We have interviewed 9 groups of three students each (7 from the 5th grade and 2 from the 6th) and conducted 6 individual interviews. The interviews were transcribed. Sometimes, the children wrote their comments, such as the one in Figure 7. We have tried to categorise the pictures by what kind of experience they communicate (for example, the children looking absorbed, happy etc.).
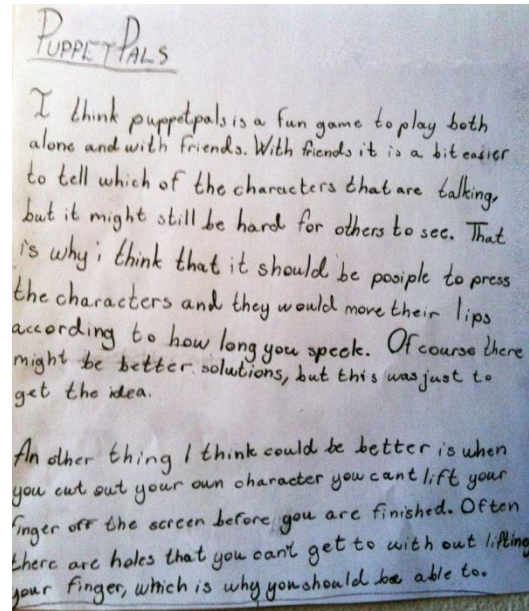

Figure 7. A child's comment on Puppet Pals.

The videos and the newsletters were used to evaluate the quality of the content, by the richness of the media used, and by the storyline. In addition, we have done an extensive literature search and found several articles (such as for example [19] and [20]) addressing some of the same issues we identified. These will also be included in the discussion below.

We have identified four important factors that influenced the experiences of the participants, both the children and the teachers. Those factors are: group work, the working space, coolness of the technology and multimodality. There are other factors such as technical issues with iPads (including the ones with apps such as mentioned in Figure 7), lack of connectors etc., or classical issues of teacher's attitude towards the new classroom tool that could be mentioned. We consider the four mentioned above as the most interesting, from the perspective of being capable, if understood properly, of positively

influencing the use of new classroom technology.

4.1 Working in Groups

For the duration of the projects, the children were working together in small groups (2-3 for the urban school and 5 for the provincial school). Every group had to plan meetings both at school and after school. Each of the groups working on Puppet Pals project produced a large number of videos clips. Some of those were highly creative and imaginative. Only a few newsletters were produced. All groups said that it was fun and enjoyable to work on projects together.

The teachers organized these projects using a standard approach to content learning. However, the learning was happening through cooperation and sharing, giving possibility to children to participate in the process on an equal basis. For teachers this brings forth some issues that they need to pay attention to. For example, they need to carefully choose the goals to be accomplished, as well as to plan on how to evaluate these cooperative efforts [20].

The authors in [20] argue also for caution with group work. It is not easy, they say, to put together a group of students. Working in a group does not remove individual problems that students may have, it does not make them more tolerant, thoughtful or involved when doing a group work.

The urban school teacher explained why he thought that the groups of two or maximum three are ideal for work with the iPads. The screen size was one of the factors. With the screen size the iPad has, he said, only two people may work together efficiently, perhaps three if they are approximately equally active. All additional students would tend to lose

attention and not contribute to the tasks at all. In both projects, measuring individual contribution to a group work result was difficult. Following up individuals that need special attention was hard, as they would move around or work at homes too. Thus, the teachers had less control over the learning process. As mentioned, they evaluated the outcomes as inferior to those of previous years (not involving any technology).

4.2 The Space for Work

We have observed that, when working on the iPad in groups, the classrooms changed physically. Tables moved around in the ways that enabled groups to work most effectively. During the normal teaching hours, the classrooms looked very traditionally: rows of desks facing the front of the classroom, two children at each desk. During the project work with the iPad, the children were allowed to use other spaces at school, as well as to work together at home. This has contributed to the fun effect, the children say. It was unusual, and though the changes were not even close in their extent to for example, the spaces described in [21], it was different and more enjoyable.

Figure 8. The image of a collaboration friendly hall, from [21].

Many believe that the environments for learning need to change in tact with learning styles. The work of Rosan Bosch [22] shows that it is possible to design spaces that better support creativity and learning.

4.3 Cool technology

In [9] we discussed the cool technology and used some of our iPad in education research to discuss concepts of situated techno-cools and perceived coolness. The two projects have been strongly influenced by both teachers and children's perception of the iPad as a cool piece of technology.

Techno-cools, such as an iPad, are often used actively in more than one use context. An iPad may be used for reading and entertainment at home in a cosy sofa, as well as a tool in a workplace. It is, however, not necessarily perceived as cool in both contexts of use. While entertaining oneself with games, movies, books or other things on an iPad, there is only an individual perception of coolness to consider. But in the work, or school context, a group perception may be more important. Figure 9 shows some of the factors that contribute to perception of the iPad as a cool item. As each factor increases or decreases, the area of perceived coolness grows or shrinks.

In these particular projects, the coolness of the iPad 1 dropped as it ceased to be innovative (the iPad 2 was better as the children said), but it was still fun enough, they mastered the apps they used, and their self-identity as the only iPad classes in their respective schools was enough to make all of the children to say in the final round of interviews that the iPads are cool. All words synonymous to cool in Norwegian that
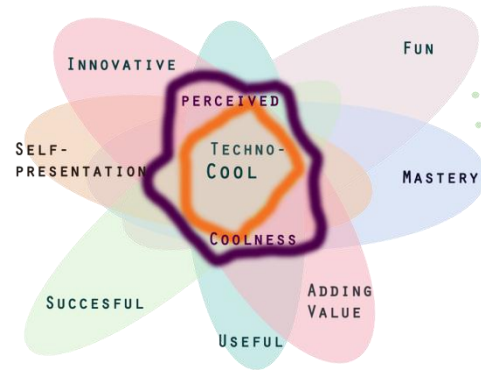

Figure 9. Factors contributing to perceived coolness.

were mentioned in interviews were counted. The word 'cool', alongside the Norwegian version 'kul', is used in the Norwegian language, with nearly the same meaning as the English 'cool' among the tweens.

4.4 Multimodality

As mentioned in the introduction, tweens are digitally literate. When the iPad was introduced as an ICT tool for the projects, more than digital literacy was needed: working with sounds, images, videos, haptic interface, gestures. This new multimodal world requires a new, multimodal literacy. This multimodality is not entirely new. It may be seen as an extension of, for example, collages, where font, color, images, signs and so on compose a more complex world of information to be decoded by a student [23].

Children are using a plethora of technologies outside of the school walls. Once inside of the school building, they have fewer choices. This issue is often underestimated by teachers. Children's competence can only be fruitful if respected and taken in account when planning the classroom activities. On the other hand, full use of their competences often has the effect that the tasks are

more fun and engaging. However, multimodality may be new for the tweens. [24] and [25] use multimodality theory to explain how the children deal with this more complex situation including graphics, sound, and touch. All of these are used in the iPad app for the newsletter or in the Puppet Pals application. The children need to cope with literacy in all these modes in order to reach the goal of creating a good narrative. Thus, we have on one side the children's perspective, where we have observed and the children have stated so themselves that working on these projects has been fun and enjoyable. On the other side, the teachers had to cope with traditional school policies and requirements, lack of time for planning new activities and parents who also have an idea of the ideal competences for their children to obtain.

In another study in the UK [26], similar to this one, the teacher had a far more open and flexible position towards defining the learning outcomes for his students. The study describes a new media journalism class, and how students developed multimodal stories: *"... described how Mr. Cardenas incorporated new online literacies into the classroom in ways that valued what the students knew and positioned them as responsible"*. In this study, also the usually disengaged students, and often positioned as underperforming, reached a goal of repositioned themselves as good authors [26].

5 CONCLUSIONS

We do not have any final conclusions. Two cases are too small a sample for us to be able to draw conclusions about iPad's paradigm changing potential and its fulfilment in the real classroom.

When is a student-centered, technology supported learning evaluated as successful by both teachers and students? Looking into why the children and their teachers had such a different experience in working with new classroom technology, we have identified many factors. Some of these, such as the technology break down, the role of the teacher etc. have been much discussed in the educational technology acceptance field [1]. Thus, we have discusses only four factors that we consider to have a potential for positively influencing the integration of new technology into classroom ecology: multimodality, project based group learning, techno-coolness and space for learning. Understanding how these influence the children and their tween culture is important for making changes towards better and smoother integration of the technology in education. They may also be helpful for the teachers when planning and evaluation the outcomes of the projects involving the new technology. In this study, the teachers have silently marginalized the use of the iPad for the remainder of the study, based on their evaluation of the learning outcome from this first trial. As a future research, we would like to consider in greater depth the possibilities to influence positively new learning processes by understanding the tween culture, their capabilities and what they perceive as cool and why. This may lead to both better design of technology for education and better use of tween's competences in group-based learning.

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