

Kiri, Nishida* Asami, Maruyama** Akiko, Tonegawa* Chihiro, Norichika* Onkei, Tou*
Akiko, Tanimura** Taeko, Yamanishi** Toshihiko, Endo*
*The University of Tokyo, JAPAN ** TOPPAN INC., JAPAN

This research is a collaboration between the The Center for Early Childhood Development, Education, and Policy Research (CEDEP) at the University of Tokyo and TOPPAN INC.

Abstract

The use of digital tools in early childhood education facilities in Japan has so far been mainly for (1) reducing the administrative burden on childcare workers, such as managing the number of hours that a pupil attends kindergarten and managing their physical conditions, (2) assisting with photography and documentation by childcare workers, (3) providing digital drawing apps, and (4) providing educational apps teaching about numbers and letters.

Among these, with regard to point (2), so that childcare workers may be able to observe the interests and mental development of children, an app has been developed that allows users to add things like comments to photos and also provides formats that refer to documents, portfolios, and learning stories. Based on the idea of “Listening to children” (Clark & Moss 2001) from the mosaic approach, this study developed an app for tablets that records voluntary reports of the children’s own interests and ideas. Through an empirical experiment in classes for 5-year-olds in kindergarten, we also examined how it is used and the issues experienced with it.

A total of 301 voluntary reports were recorded from three different kindergartens during a five-month demonstration experiment. The reading of QR codes for personal identification was viewed as inconvenient, and the number of reports therefore decreased over the 5 months. Individual differences were observed in the number of reports, and correlations with temperament were also observed. There was also a difference in the number of reports based on the kindergarten, suggesting that the positivity of the teacher toward the app influenced usage. Photos and videos of up to 20 seconds in length can be recorded for each submission. Depending on the content of the report (creativity, accomplishment, discovery, a wish to be heard), the utterances recorded in the video were also different. In addition, there were records unique to videos, such as the significance of creations, and demonstrations of jump ropes and spinning tops. It was also found that kindergarteners could attempt to capture and report phenomena in various ways, such as taking photos with an outward or inward facing camera, taking photos with vertical or horizontal orientation, making reports while indoors or outdoors, and filing reports while alone or with friends.

Regarding changes after the experiment, a questionnaire distributed to kindergarten teachers revealed answers such as “students started to actively convey what they liked and what they disliked more readily than before,” “new discoveries were made,” and “there was an increase in talking about interests between kindergarteners.” On the other hand, concerns were raised that “it may not be possible to leverage app records.” It is necessary to improve review functionality.

Summary of the Empirical Experiment

Test period: October 2020 to February 2021

Kindergarten Cooperating in the experiment: 61 students in classes for 5-year-olds from two public kindergartens and one certified kindergarten in Shizuoka Prefecture (Japan).

Method: We set up a tablet with the app installed on it in the kindergartens and asked the kindergarteners to come make a report when they wished.

Overview of the app:

(1) The application is controlled by touching the selection buttons and control buttons on the tablet screen. First, the app is opened and either Record Mode or Viewing Mode selected.

(2) In recording mode, the QR code distributed to each kindergartener is presented and the recorder is identified.

(3) A selection is made from one of the four criteria of “creativity,” “accomplishment,” “discovery,” and” a wish to be heard” based on the type of things the student wants to report.

※ In a prototype version of the app created in 2019, with no selection buttons in it, more than 90 percent of reports were filed in the “creativity” category, therefore other buttons were laid out to make people realize that there were other types of report possible.

(4) A camera is activated, so the kindergartener can simply press the shutter button to capture a still image.

(5) A video camera starts up so kindergartners will explain what they have recorded and what they wish to be heard in up to 20 seconds.

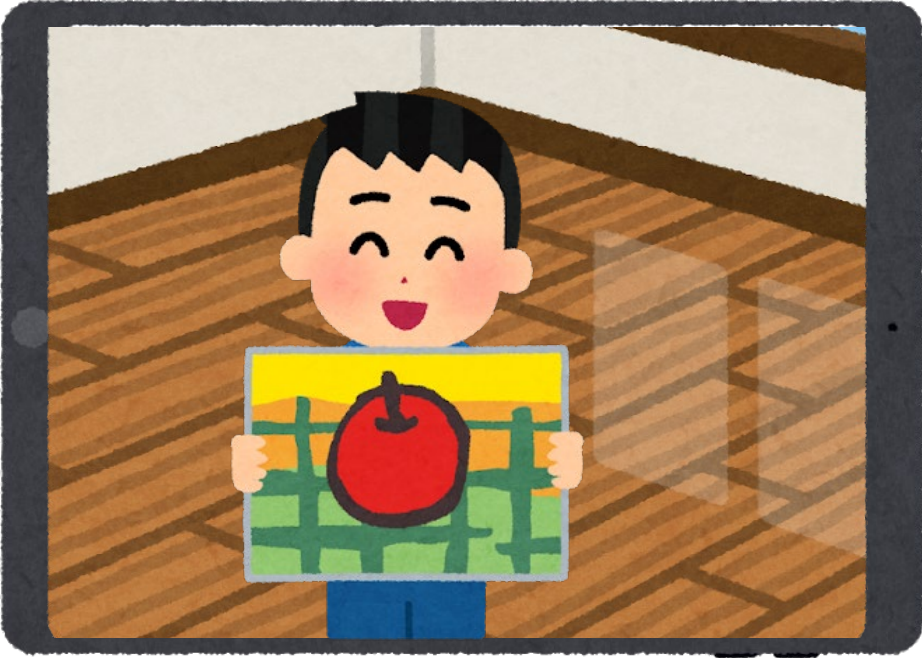
(6) A rating button is displayed, so the user can select a rating by touching it, regarding the “degree of effort extended” and “how much you liked it” as it relates to the report.

(※ This feature was added to be able to narrow down the records to those that were particularly liked when reviewing them.)

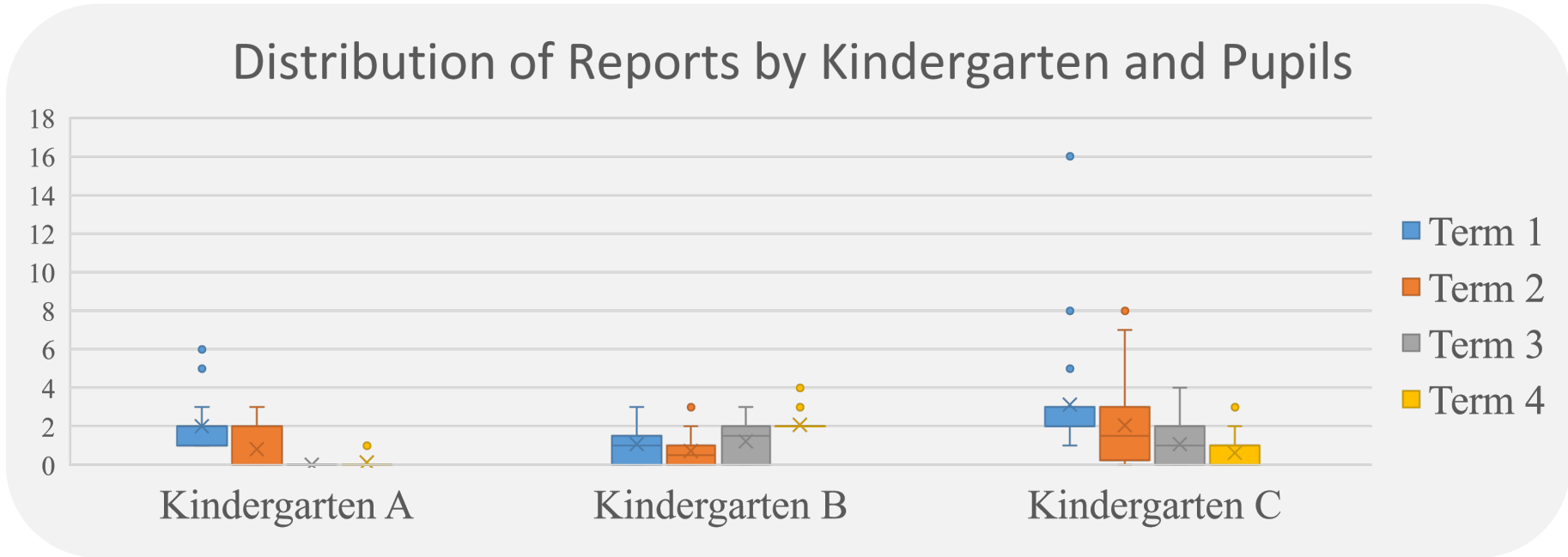
(7) In viewing mode, the user can look back over what they have recorded and what other pre-schoolers have recorded.

Questionnaire (childcare workers):

Children’s temperament (CBQ; Rothbart et al.)
Post-experiment changes



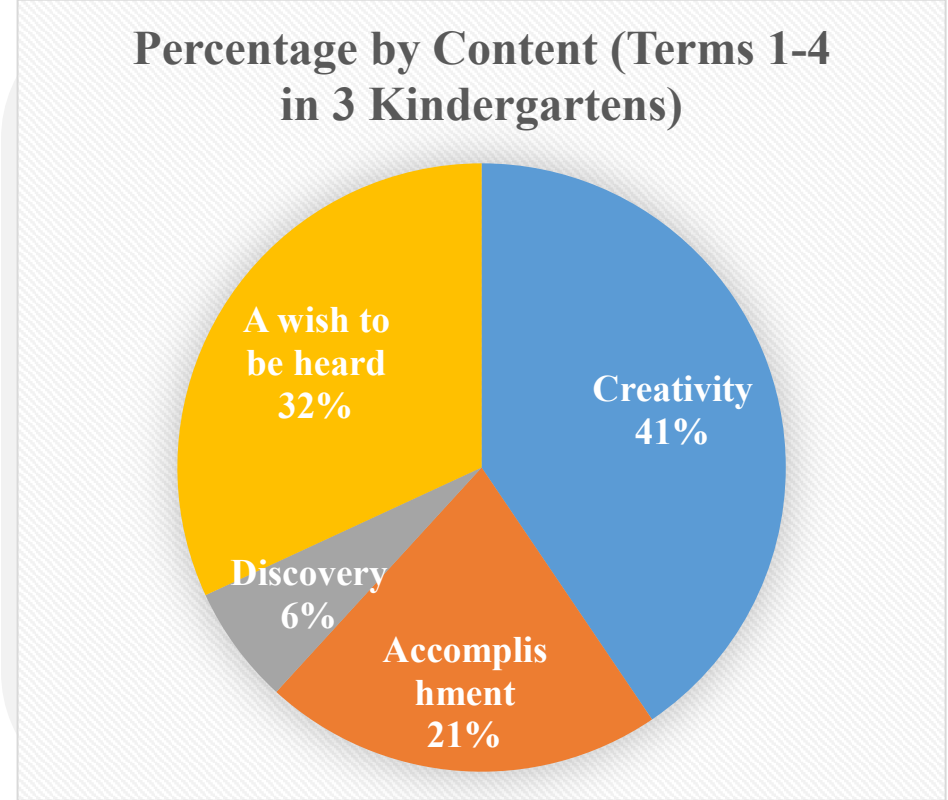
Results



- 301 reports were recorded.
- In two kindergartens, reports decreased over time. The reason offered by childcare workers is that the reading of QR codes is awkward.
- A correlation with temperament was also observed. Children in the kindergarten who originally had a lot of positive/negative communications tended to report more often.

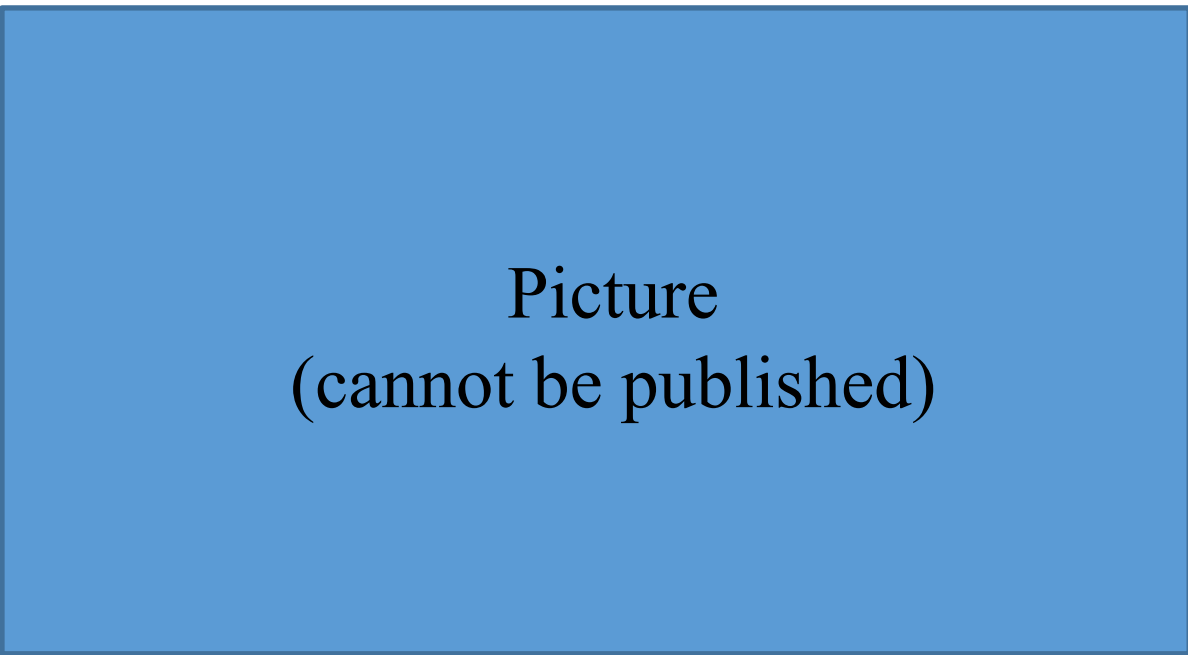
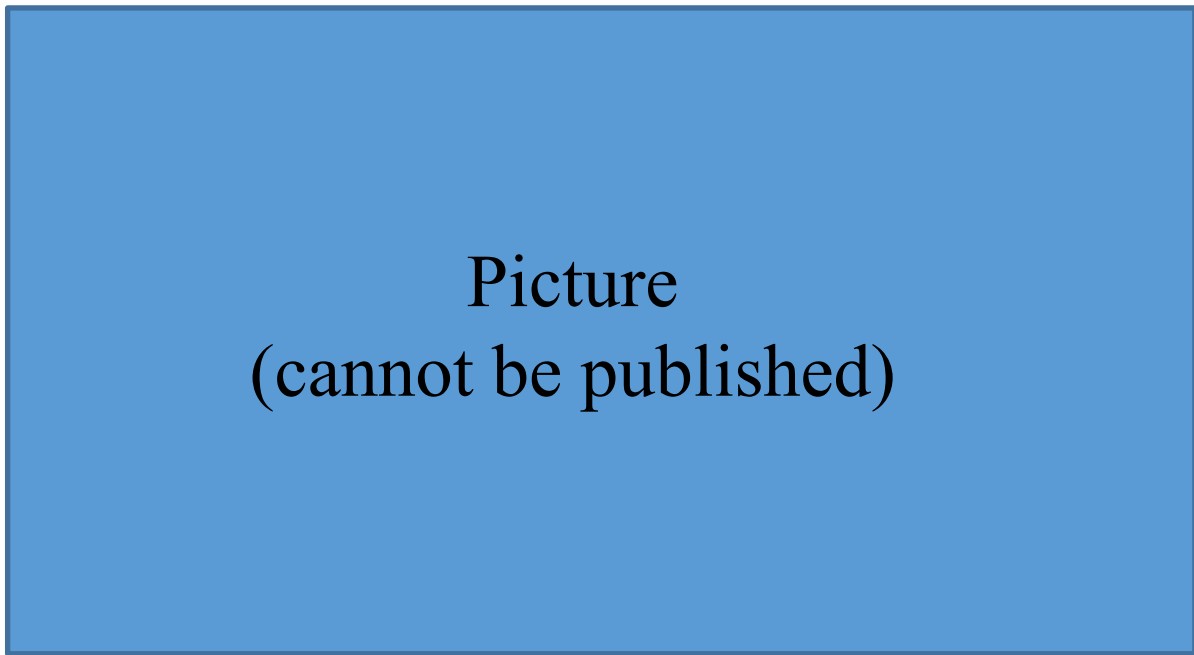
CBQ temperament dimension	Activity level	Close and positive expectations	Pleasure from strong stimuli	Introversion	Sadness	Concentration	Suppressive control
Number of reports and Pearson correlations	-0.097	.272*	-0.021	0.113	.448**	0.166	0.117

* significant at p<.05 (both directions)
** significant at p<.01 (both directions)

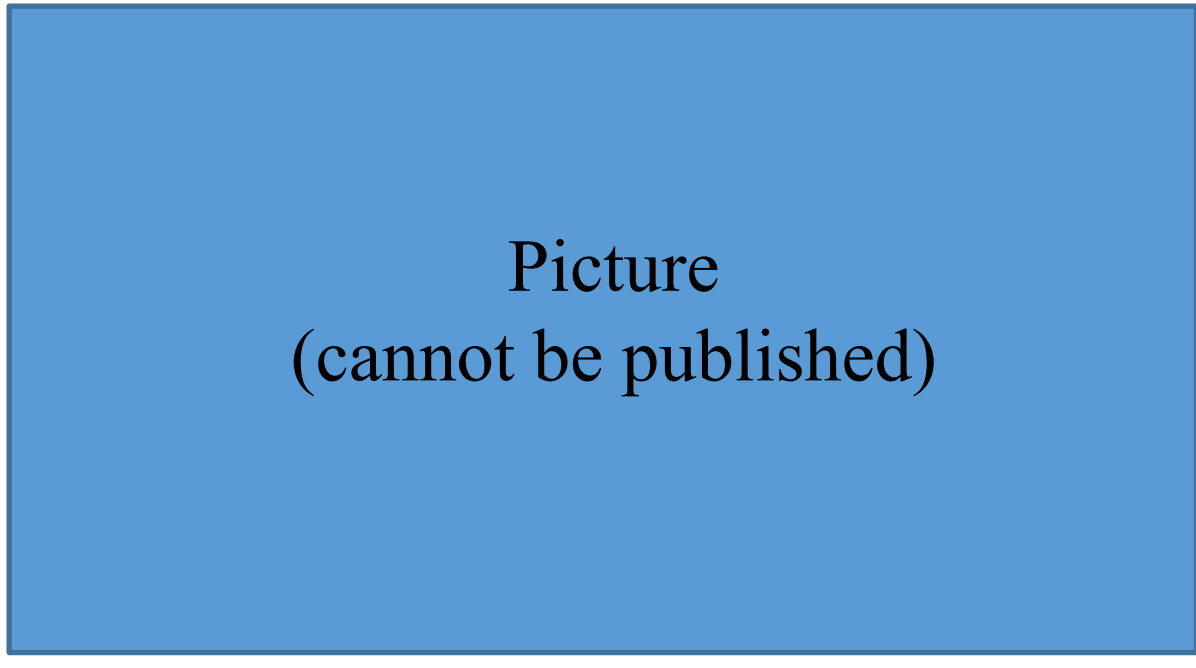
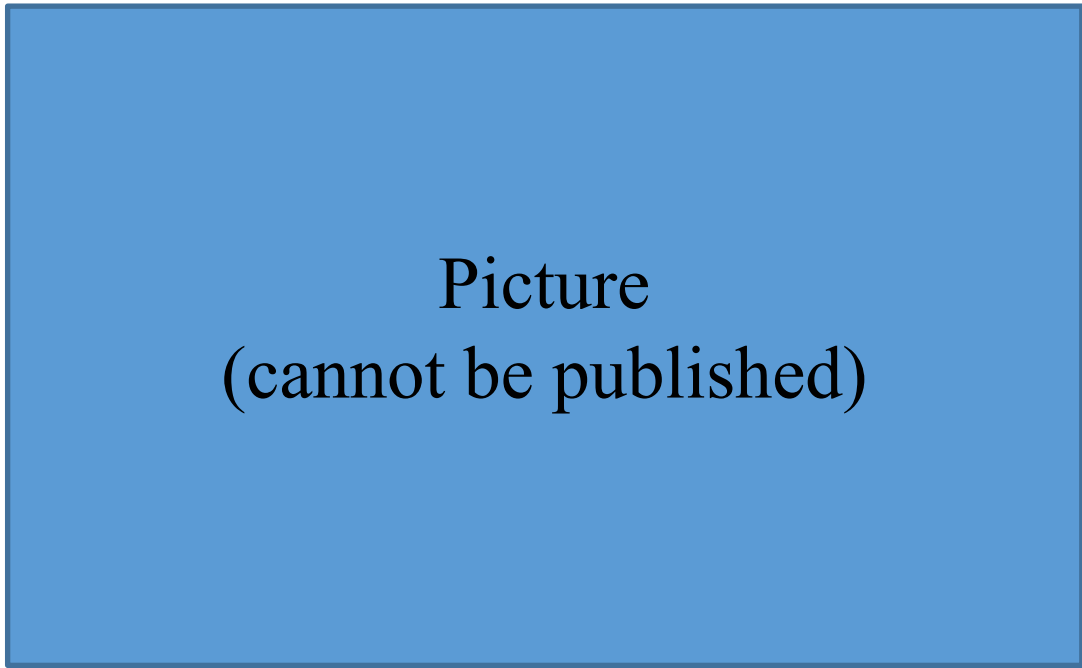


Selection button	Characteristics of the utterances	Example of speech
Creativity	The name of what was created Explanation of what was created What the student found difficult when creating it	I made a castle. Here's the roof, here's the window. It was hard to put it together.
Accomplishment	What was achieved Challenges Feelings of achievement	I was able to jump in front of someone while playing jump rope. It was hard to turn. I was happy.
Discovery	Name of what was found Where it was found	I've found acorns. I found it with XX.
A wish to be heard	What was enjoyed that day Special events Things the student found interesting outside of the kindergarten.	I enjoyed XX today. I got a letter from Santa. The road was uneven while works were being carried out on it.

Reports on “creativity” were the most common report, but no extreme bias was observed. Depending on the content of the report, the content of the speech in the video was different. →We were able to record the significance attached to things as well as utterances surrounding thoughts, and other phenomena in a manner such as could only be accomplished through video.



“I thought it was interesting because the road under construction was uneven.”
He has reported about the string figure many times. The shape becomes more and more complex

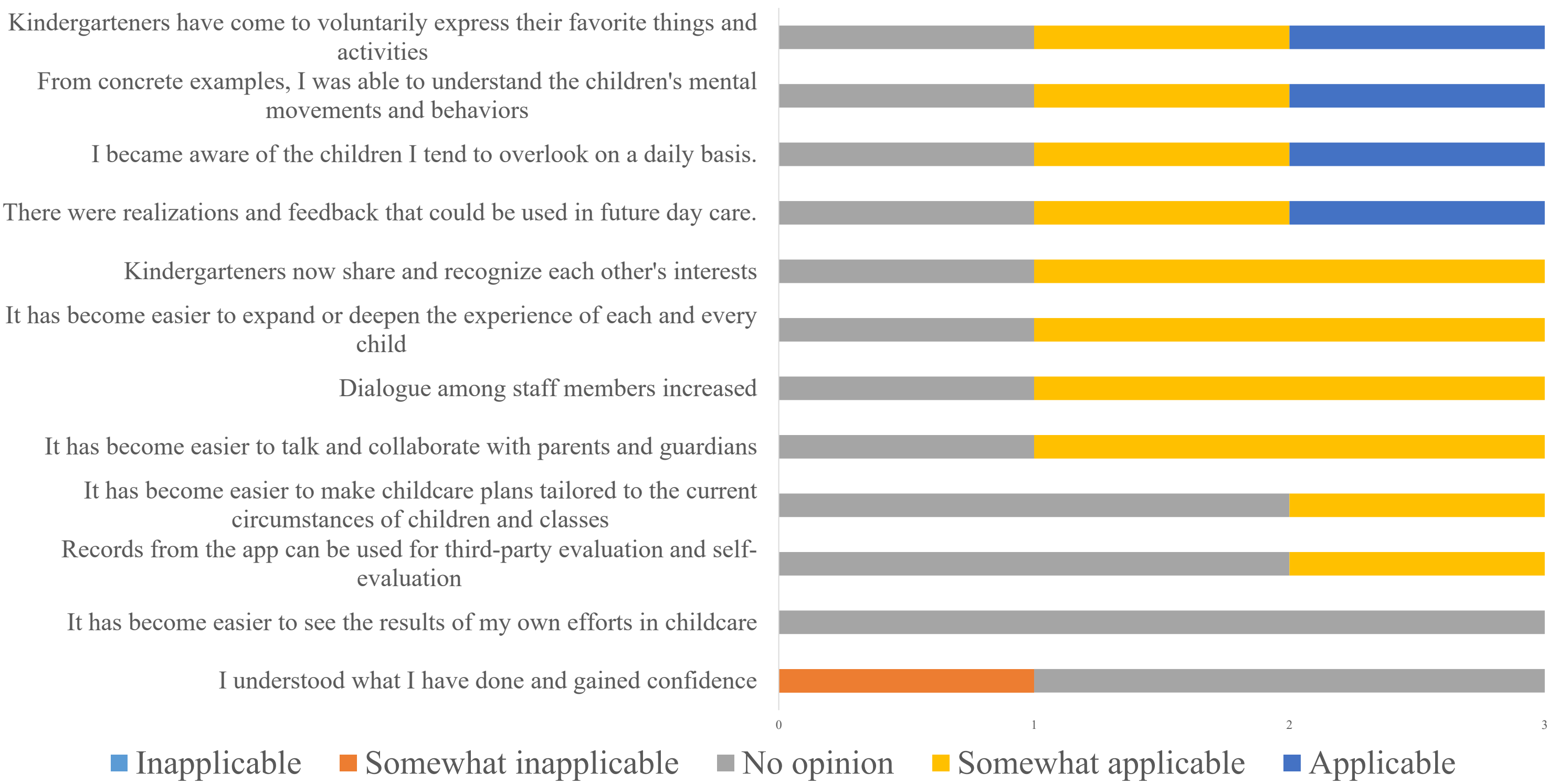


“I’ve found a lot of acorns.”
“I made a spinning top with the acorns and spun it.”

Changes post-experiment (Questionnaire Survey of Childcare Workers)

They found it easy to notice changes in kindergarteners and manners of communication. On the other hand, they found it harder to notice changes in themselves and the fact that they didn’t know how to leverage the results was seen to be a problem.

Changes after the Experiment (Questionnaire Survey of Childcare Workers)



Conclusions

Implications of the empirical test

- ✓It is possible that photography and video capturing carried out by the kindergarteners enables the recording of various acts of communication by the preschooler.
- ✓It is possible that the usage of the app among kindergartens may be linked to children expressing their interests, sharing these with others, and realization on part of the childcare workers.
- Further changes identified through the empirical test
- ✓The reading of QR codes, which enable personal identification, is seen as irritating and makes it harder for children to record → A simpler method to identify individuals is required.
- ✓Childcare workers do not know how to parse records → It is important to fine-tune the retrospective function.