The Development of an App for Tablets that Records the Voluntary Reports of Kindergarteners and its Utilization in Kindergartens

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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 kindergartens, 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 kindergartens, 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 unique 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 Shizukuoka 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.
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 kindergarteners 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

Distribution of Reports by Kindergartener and Pupils

<table>
<thead>
<tr>
<th>Kindergartener A</th>
<th>Kindergartener B</th>
<th>Kindergartener C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time 1</td>
<td>Time 2</td>
<td>Time 3</td>
</tr>
<tr>
<td>Number of reports</td>
<td>Number of reports</td>
<td>Number of reports</td>
</tr>
<tr>
<td>120</td>
<td>90</td>
<td>70</td>
</tr>
<tr>
<td>0.097</td>
<td>0.067</td>
<td>0.047</td>
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<tr>
<td>272</td>
<td>235</td>
<td>199</td>
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<td>0.011</td>
<td>0.013</td>
<td>0.014</td>
</tr>
<tr>
<td>1.13</td>
<td>1.44</td>
<td>1.58</td>
</tr>
<tr>
<td>0.06</td>
<td>0.17</td>
<td>0.14</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percentage by Content (Terms 1-3 in 3 Kindergartens)</th>
<th>Imagine the people</th>
<th>Feelings of achievement</th>
<th>Feelings of control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creative</td>
<td>10%</td>
<td>50%</td>
<td>40%</td>
</tr>
<tr>
<td>Accomplishment</td>
<td>10%</td>
<td>50%</td>
<td>40%</td>
</tr>
<tr>
<td>Discovery</td>
<td>10%</td>
<td>50%</td>
<td>40%</td>
</tr>
<tr>
<td>To be heard</td>
<td>10%</td>
<td>50%</td>
<td>40%</td>
</tr>
</tbody>
</table>

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.

Changes post-experiment (Questionnaire Survey of Childcare Workers)

They found it easy to notice changes in caregivers 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.

I thought it was interesting because the road under construction was uneven.
(※ This feature was added to be able to narrow down the reports of the app.)
(4) A camera is activated, so the kindergartener can simply press the shutter button to capture a still image.
(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.
(2) In recording mode, the QR code distributed to each kindergartener is presented and the recorder is identified.
(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.

Changes after the Experiment (Questionnaire Survey of Childcare Workers)

Kindergarteners have come to voluntarily express their favorite things and what they disliked. They have come to realize that the road under construction was uneven.
(5) A video camera starts up so kindergarteners will explain what they have recorded and what they wish to be heard in up to 20 seconds.
(4) A camera is activated, so the kindergartener can simply press the shutter button to capture a still image.
(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.
(2) In recording mode, the QR code distributed to each kindergartener is presented and the recorder is identified.
(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.

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 kindergarteners may be linked to them 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.
✓ Kindergartners do not know how to parse records → It is important to fine-tune the retrospective function.