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# The Media Maturity Matrix

## Assessing educator´s attitudes and practice for "Medienbildung" in the digital age in three dimensions (learning goal, developmental stage, type of medium)

### Introduction, Problem and Target

The innovative survey tool Media Maturity Matrix was developed for the MünDig study, an online survey, conducted among German progressive education-oriented settings (Montessori, Waldorf and Nature education kindergartens and schools) (n=1390 teacher, n=5799 parents, n=417 students).

Many existing models (e.g. the technology acceptance model (Köhler et al., 2014) and the SAMR model (Puentedura, 2014) ) record only the use of digital (screen) media in educational institutions. The target, that resulted from the pre-interviews with the target group of the study, was to develop as an extension a tool that allows a more differentiated investigation including a) analogue and digital media, a) the objectives for which the respective medium is used, and c) the stage of development of the child.

### Method

Meeting these requirements led to a classification in a three-dimensional matrix which we call **Media Maturity Matrix (MMM)**. The MMM differentiates between three dimensions:

a) the type of medium (analogue vs. digital and/or with vs. without screens, which is not always congruent, e.g. disassembling digital devices is a non-screen activity)
b) the type/purpose /intention/objective of use (by means of selected examples)
c) the developmental stage (represented by age, limitations see discussion)

For b) the categorization from the "Medienkompetenzrahmen NRW" was used, with six skill areas for learners:  1) produce and present, 2) use and apply, 3) problem solving and modeling, 4) search for information/investigate, 5) analyze and reflect, 6) communicate and cooperate. 4 additional areas were the following: 7) media use by the professionals, 8) parent counselling/cooperation (technical/pedagogical), 9) resource-oriented prevention of digital risks, 10) support for coping with problematic media experiences.

For this purpose, the study worked with 60 exemplary activities, 6 for each area, with screen-based and non-screen activities in areas 1 to 7. These were presented as item text plus graphic representation (Fig.), to which the educational  professionals, parents and students were asked: *"in which age span is it helpful/suitable ("sinnvoll") for children to do the following in school/kindergarten?"* (results Fig. 2 and 3). To minimize answering time despite high complexity, we created a double slide rule tool (right side of Fig. 1) in cooperation with Dominic Leiner (SoSciSurvey) which automatically filled in 18 as end age if starting age was entered (a one-click action), unless this was changed, and entered zero as starting age when end age was entered. In the survey for professionals, for a random 3 out of 10 areas, the same questions were repeated for actual practice (result Fig. 4). We reduced this from originally 10 out of 10 areas in the pilot stage of the survey to reduce dropout rate.

Additionally, a simple dichotomy (*"beyond these exemplary activities, how frequently do children actually use screen/non-screen media in your classroom?"*, results Fig. 5) was recorded for the main age group in which the professionals were active, using a five-point Likert scale.

Figure 1: The Survey tool – example for "helpful/suitable" in area 1: Produce and Present



### Examples for results from area 1 out of 10: Produce and Present

Figure 2:
Which exemplary activities with media with and without screens should children perform at what age, from the point of view of educational professionals?
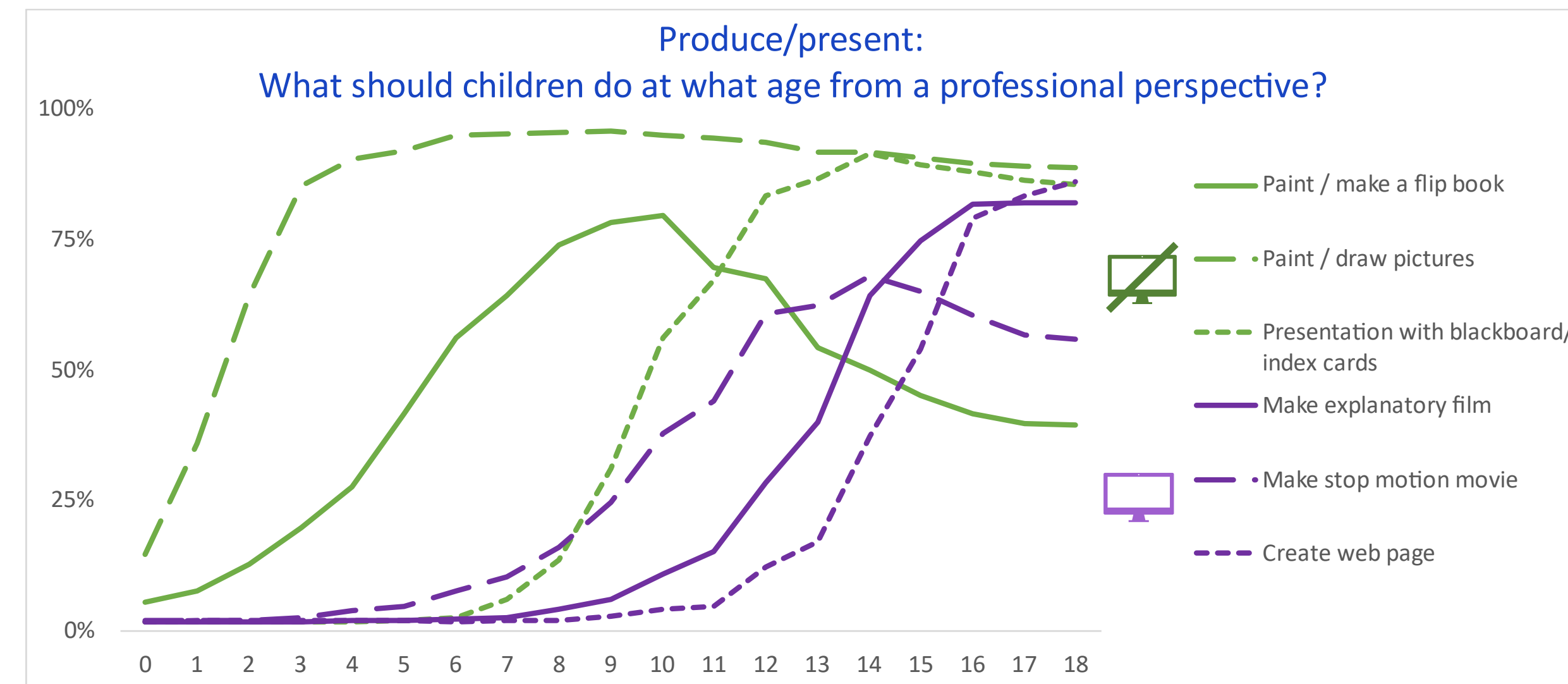n=644-685



Figure 3:
Which exemplary activities with media with and without screens should children perform at what age, from the point of view of parents?
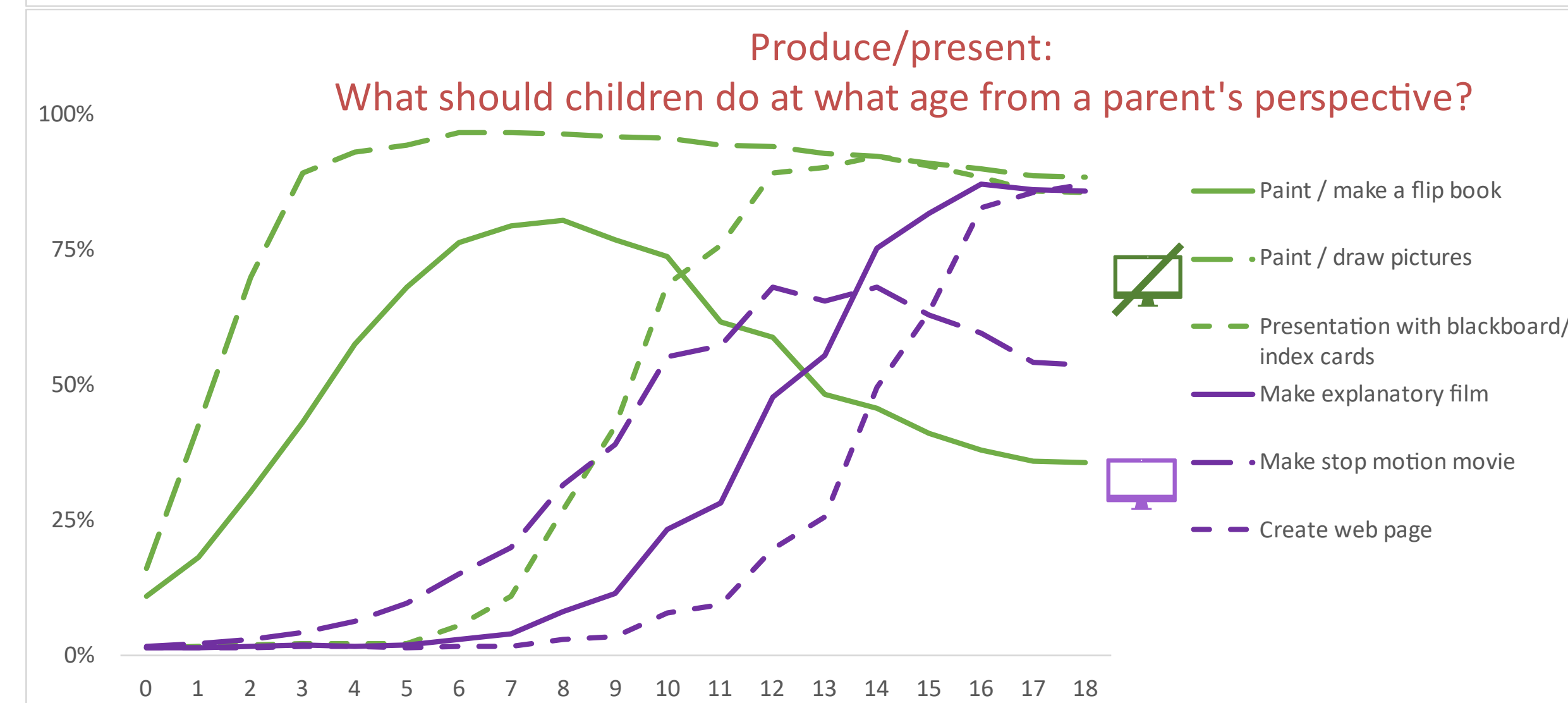n=3184-3464



Figure 4:
Which exemplary activities with media with and without screens do children actually perform at what age, according to educational professionals?
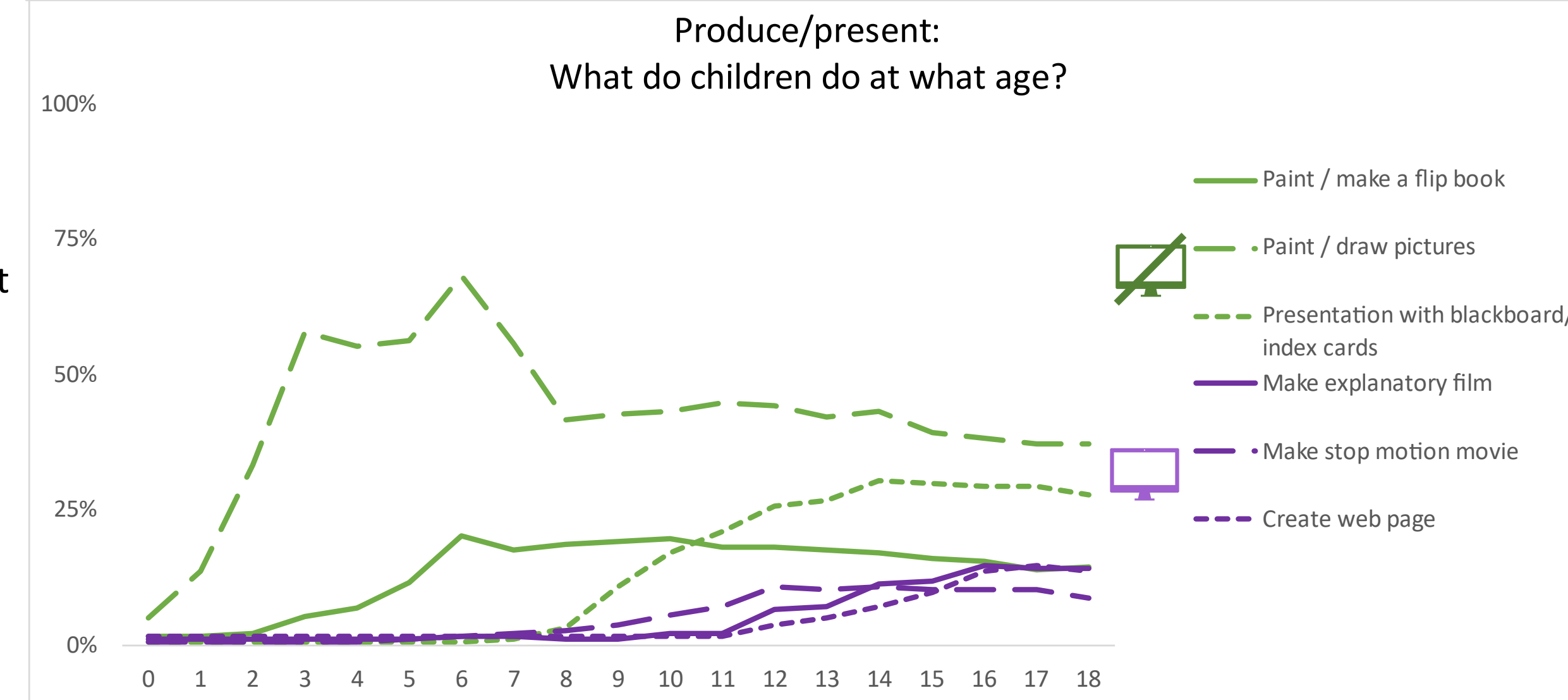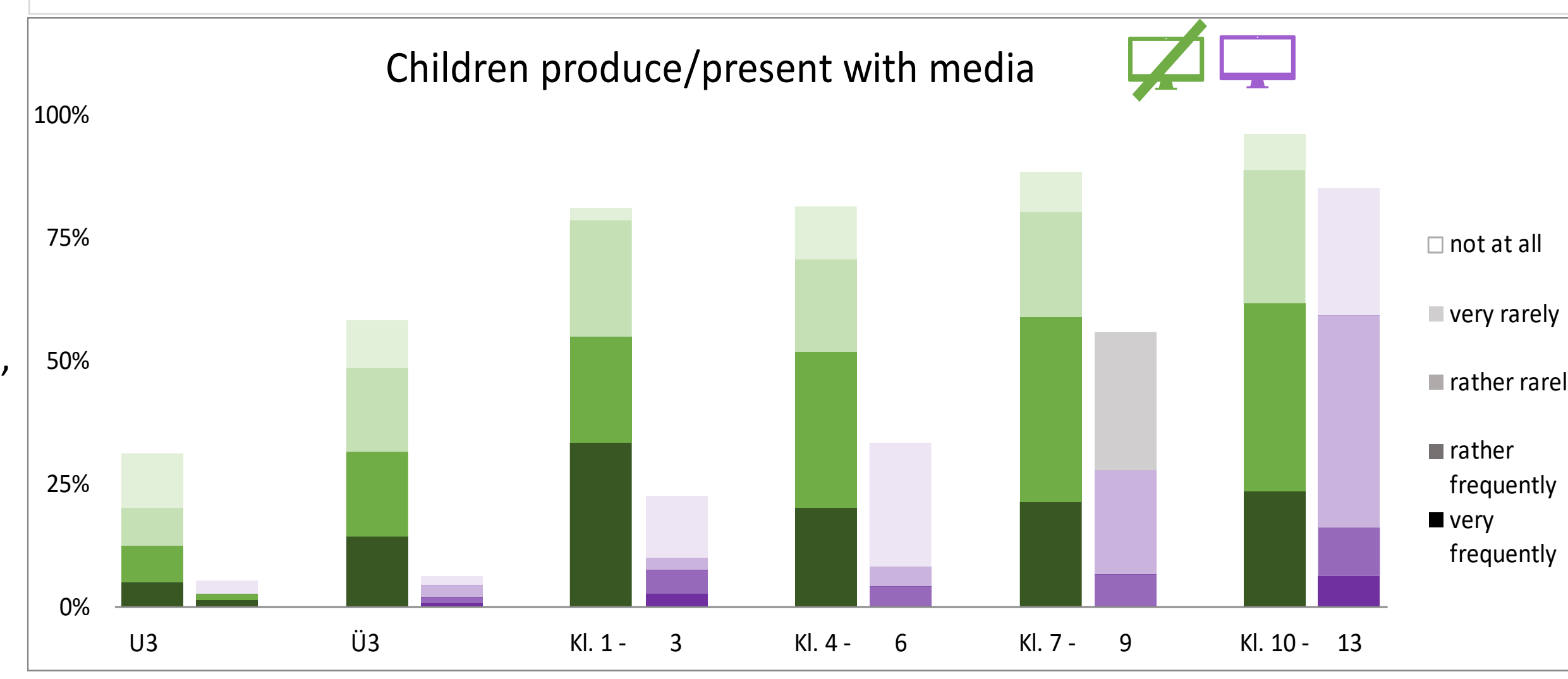n=183-189
(practice slide rule)



Figure 5:
Which type of medium do children actually use at what age, according to ed. Pro.
total n=636-642, U3: n=79-80, Ü3: n=300-303, Kl. 1-3: n=40-42, Kl. 4-6: n=75, Kl. 7-9: n=61, Kl. 10-13: n=81



### Discussion

#### 1. Acceptance/suitability of the survey tool

In alternative/progressive-education oriented schools and kindergartens (mainly Montessori/Waldorf), the acceptance of the tool seems to be high, reflected above all in a high completion rate of the MMM section of more than 60 % despite the long duration (50 minutes for professionals, 30 min. for parents ) needed for completion.

#### 2. 12 clicks or two clicks per area for recording professionals' practice?

The dichotomy (with/without screen) with two items per area was recorded only for the age group in which the educators stated to be mainly active in. On the one hand, this is a gross simplification, as our qualitative pre-studies showed that the target group found it difficult to answer general questions on screen/non-screen media, but easy to give examples of activities. On the other hand, the short version as aggregated data (Fig. 5) shows results consistent with the answers given using the double slider with the 6 exemplary activities, (Fig. 4) and is far less time-consuming.  In the future the double slider tool could be used to record what is considered suitable at what age, whereas the simpler tool could be used to record practice for a specific age group.

#### 3. Age as questionable proxy for developmental stage

Is age an adequate way to account for developmental stage, knowing that children of the same age can have very different developmental paths? This remains a problem, even though to ameliorate this, an introductory passage was used in the survey: *"although this can be different from one child to the other, please consider an imagined  child with "average/standard" development when choosing an age span"*. In an open text field, participants were asked to describe potentially different practice for "non-average children" (results not presented here).

#### 4. Study Limitations

Although the Focus of this poster is on the tool and not the results, it is important to mention study limitations. The MünDig survey is not representative, even of Montessori/Waldorf/Nature oriented settings. It remains an  explorative study despite the large number of participants.

### Conclusion

#### 1. Potential of the MMM in other settings

Using  MMM to describe both practice and attitudes of educational professionals outside the target group of the MünDig study would allow for interesting comparison.

MMM can be used in two ways: 1. To investigate the question which type of medium is considered suitable for which purpose/learning goal at what age/developmental stage, extending existing models of "technology acceptance" (like TAM). 2. As a tool to document the current practice in the educational institution in detail. The first, attitude-related version of MMM can be used by parents, teachers and older students.

#### 2. A useful tool for Technology Assessment (TA)

The study results show that media activities are predominantly non-screen activities in progressive-oriented lower schools and kindergartens. If the use of screen media is increased, e.g. in the context of initiatives to digitize education, it is essential for a sound Technology Assessment (cf. Bleckmann & Pemberger, 2021) to record to what extent new digital activities may displace former non-screen activities (assuming a net equal time spent in the institution).

#### 3. MMM allows for focus on resources rather than deficits

Especially in early childhood education, recording only the attitudes and activities with screen media tends to give a deficit-oriented picture of education for the digital age (Medienbildung), when in the eyes of progressive-education-oriented parents and professionals, non-screen activities are both more suitable AND more commonly carried out. This is even the case for teaching ICT skills – results are not presented here. The idea that non-screen activities could foster skills for the digital age is not exclusive to progressive-education oriented settings (cf. csunplugged.org).

Therefore, using MMM with its balance between screen-based and non-screen-based activities in regular state kindergartens and schools appears very promising.

#### References

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