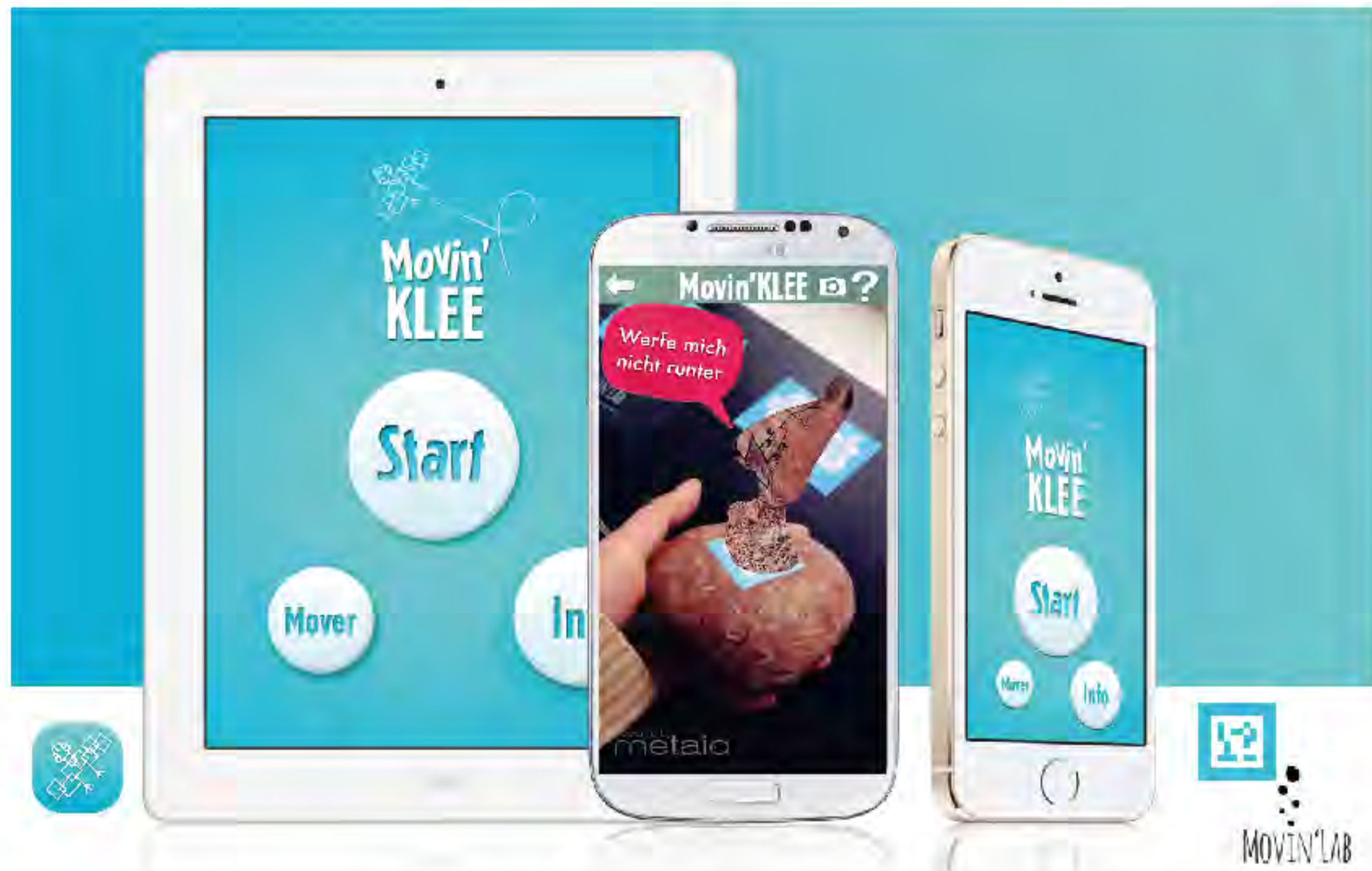


# Learning by Playing with Augmented Reality at Art Museum



The App "Movin' Klee" for Paul Klee - Mythos Fliegen exhibition

## Abstract

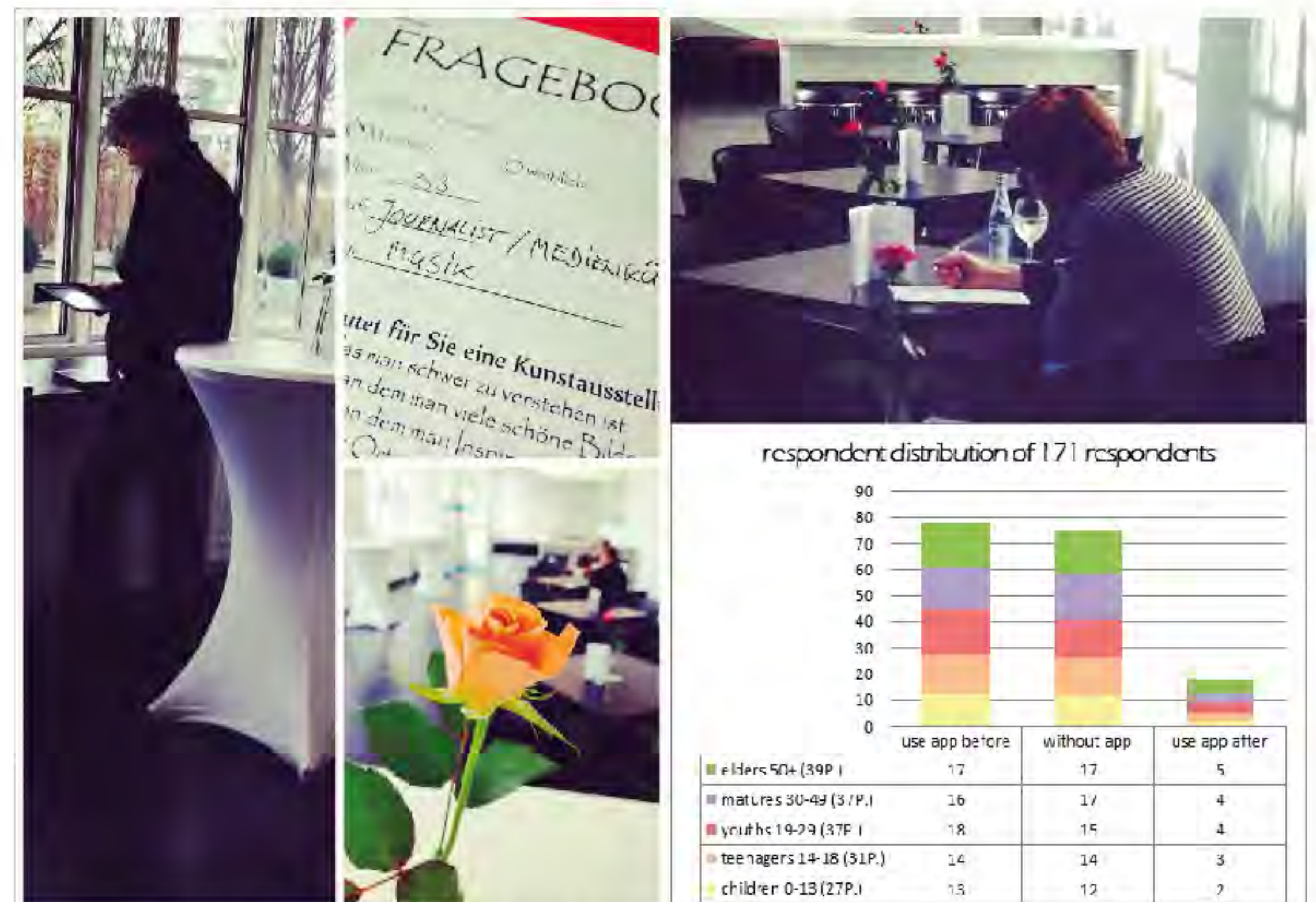
Learning and meaning-making are the basic need coming from human nature. Improving the learning experience with a combination of learning and fun-making were still unsatisfactory. Compared with learning places, museum is one of the best representations based on learning theories, for both knowledge and fun. Through a reviewing on learning theories and case studies, it is found that learning experience at art museum is not well provided due to no combination of meaning and fun making.

Motivated by improving the learning experience at art museum, a solution based on Augmented Reality implemented on platforms of smartphones and tablets is proposed and taken into practice. In this thesis, an app so called "Movin' Klee", as the combination of AR technique and smartphones/tablets technology, has been designed and developed. This app successfully attracted more visitors and provided a more efficient learning experience by realizing the hypothesis of learning by playing. To evaluate the performance of 'Movin' Klee' on the enhancement of learning effect, usability test, observation study and questionnaire are conducted. Usability test shows public was highly motivated by the new experience and perspective of art works. Observation indicates the positive effect on making visitors pay more attention to the art works more than ever before. Questionnaire implies the remarkable positive effect of an advanced learning experience and the new extended impression of art museum/exhibition.

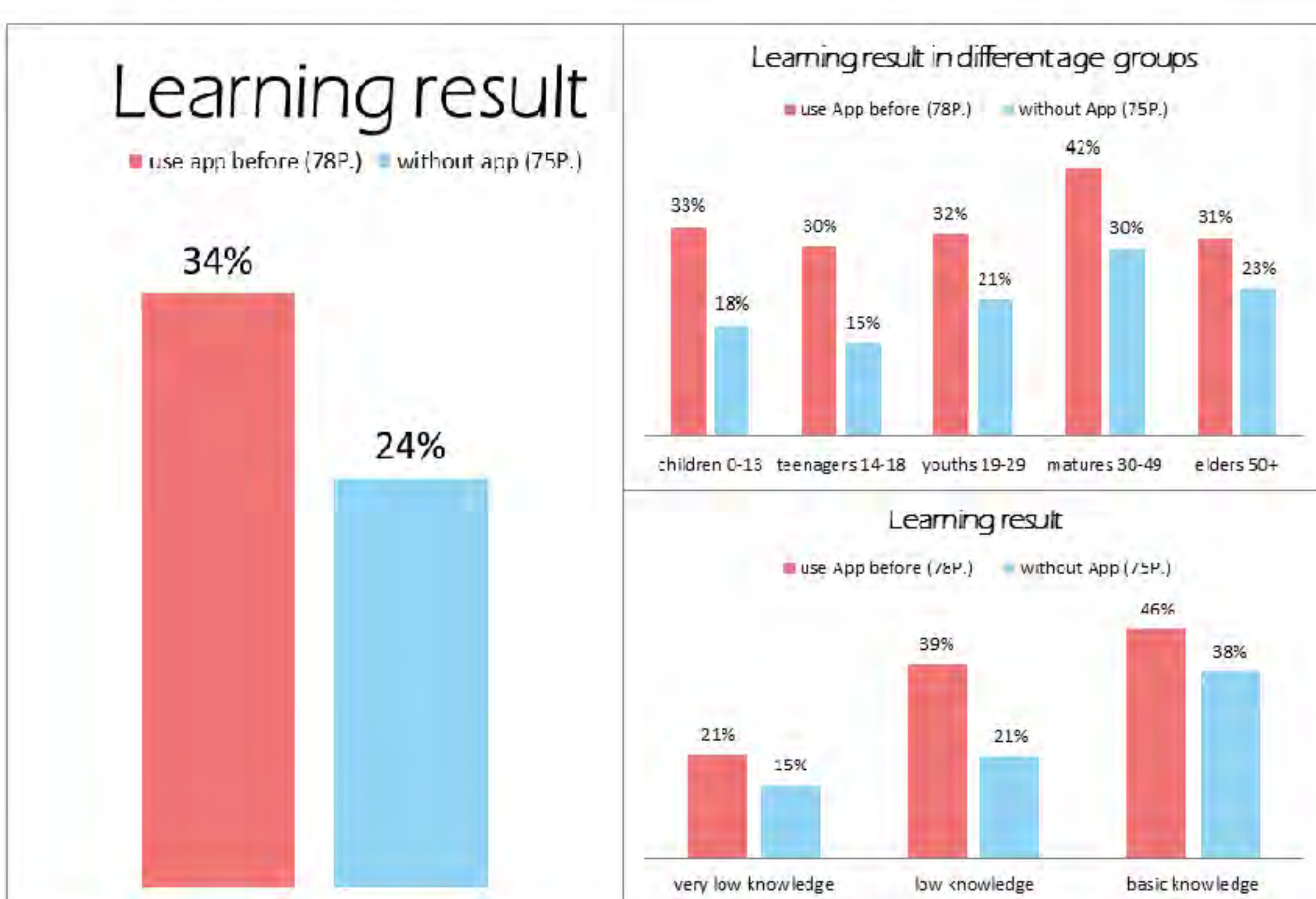
## Special Focus

The aims of this thesis are to find a way to improve the learning experience at art museums via "learning by playing" hypothesis. The objectives can be summarized as follows:

1. To identify the problem for improving learning effect through understanding human learning
2. To review the development of smartphone/tablets technology and the Augmented Reality technique for learning and fun making
3. To design and develop "Movin Klee" based on the hypothesis of "learning by playing"
4. To evaluate "Movin Klee" on the learning experience by realizing the hypothesis of learning by playing through three means, which are usability test, observation and questionnaire



Questionnaire at Paul Klee exhibition; 171 respondents



The table of learning result through questionnaire at exhibition

## Result and Future Work

An Augmented Reality application "Movin' Klee" based on the idea of "alive paintings" using 'Movin Klee' has been designed and developed. To evaluate the performance of 'Movin' Klee' on the enhancement of learning effect, usability test observation study and questionnaire are conducted:

1. Usability test shows the incredible potential at amusing people with its variety of beautiful animations.
2. The three-days-observation during the exhibition has been conducted in order to investigate how deeply the people will be attracted by this app. The observation provides good evidence of the positive influence effect the learning experience.
3. Questionnaire survey certifies that "Movin Klee" successfully realizes the new novel experience of "learning by playing with AR" and proves its incredible end-effect on helping the children, teenagers and low-prior-knowledge art visitors to get more benefit from their museum experience.

The future work includes

1. To investigate the human learning following the learning circle and to investigate whether they actually obtain the knowledge from the exhibition into their own collection for a longer period of time
2. To develop and implement more AR functions
3. To make more impressive experience by AR for the hypothesis "learning by playing"



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