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## Developing a mobile application to increase pre-schoolers' vegetable acceptance and self-regulation skills – The 'Mole Minds Veggies' game

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### Abstract

**Introduction:** Many pre-schoolers in Finland eat too little vegetables, fruits and berries. Compared to fruits, vegetables are in general less well accepted. Since most of the Finnish 4–6-year-olds attend pre-schools, they are an ideal setting for promoting vegetable consumption. However, early educators in the pre-schools need engaging methods for food education. The aim of this project is to develop a mobile application that can be used in pre-schools to improve vegetable acceptance among pre-schoolers. An additional aim of the application is to increase self-regulation skills, i.e., we aimed to build the application in a way that, instead of immediate reward and impulsivity encourages self-regulation and delayed gratification.

**Materials and methods:** We organized workshops in three pre-schools in order to collect ideas and experiences from pre-schoolers and early childhood professionals. Based on the workshops, a Finnish educational game company NordicEdu designed the first version of the prototype. A multi-professional team with expertise in early childhood education and pre-schoolers' health behaviours commented the prototype, which was then updated and uploaded to application stores. The prototype consisted of two sections: a teacher-led 'Learn' section that encourages a group of children to share their knowledge and feelings about vegetables and fruits with each other and mini-games as well as physical exercises that can be played in a group. The application also allows the group to record which vegetables they have tasted. The feasibility of the prototype was tested in the three pre-schools. We collected feedback from the early childhood professionals and children with video-recordings and interviews.

**Results:** Based on the feasibility tests, the children enjoyed using the application and they also gave positive feedback about the visual identity of the application. However, the early childhood professionals thought that the application could be a bit more challenging. Additional contents as well as tasks requiring more self-regulation and patience were also hoped for.

**Discussion:** In 2019, the prototype will be further developed into a full demo. Additional vegetables will be added to the 'Learn' sections and organized into seasons. The application will be accompanied by a teacher's guide containing more information about the vegetables and fruits. The full demo will be completed in spring 2019 and translated into English and Polish. The effectiveness of the application to increase the acceptability of vegetables will be tested in a randomized intervention in pre-schools in Finland, Poland and the UK.

### Conflict of Interest

There is no conflict of interest.