Innovative Road Safety Education Program

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Introduction

Evaluation of an attention-training program

The evaluation of the attention-training program developed by the Norwegian Council for Road Safety, in collaboration with SINTEF and Nord University, highlights a significant advancement in road safety education. This program integrates the latest findings in Neuro-Education, emphasizing not only the importance of traffic rules but also the critical skill of managing attention in complex traffic scenarios, which has previously been overlooked in educational settings.
The program employs methods designed to stimulate children's reflection on key traffic safety issues, focusing on three core concepts: **risk, orientation, and attention**. This approach aims to enhance children's ability to navigate and respond to the dynamic nature of traffic environments effectively.

The training was conducted at The Eberg Traffic Center in Trondheim, Norway, which features a 600-meter traffic system that includes various elements such as intersections, traffic lights, and road signs. This realistic setting provides an ideal environment for practical learning and application of the concepts taught in the program. Overall, the initiative represents a proactive step towards improving road safety education for children by equipping them with essential skills for real-world traffic situations.

Objectives

- The main objective was to find if the new education programme helped the children develop "cognitive maps" from the environment, identify risk factors, predicting changes in the environment and make planning actions.
- Does the new teaching model improve childrens' learning and skills when it comes to risk understanding, orientation, and distribution of attention
- To what extent can Virtual Reality be an effective tool for evaluating new road traffic education programs?

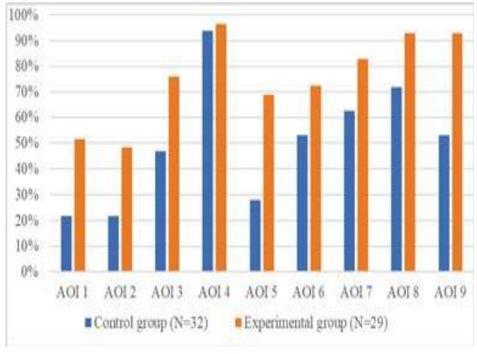
Methods

- **Risk factor mapping and practical training:** The teaching took place in an environment where the children divided in groups had to map the risk factors under the supervision of a teacher. This exercise stimulates the most important cognitive functions associated to sustained attention and spatial orientation and increase the ability to form episodic memories.
- **Eyetracking in VR:** Registration of time stamped fixation points, total fixation duration, and time to first fixation for each Area of Interest (AOI) in the virtual world. AOIs are invisible rectangular planes defined to register the eye fixation points of the children in these areas.
- **Post questionairre**

Methods

Practical training at Eberg traffic center and eyetracking in VR-lab at SINTEF, Trondheim, Norway

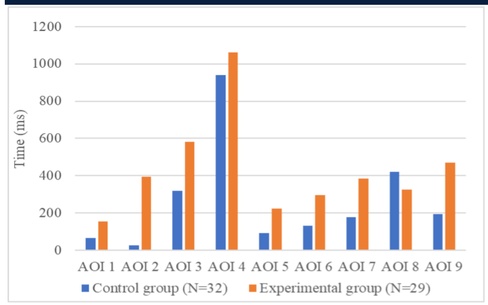
Results



Proportion of children in the groups who fixated the targeted AOIs.

- The children in the experimental group fixated on average 6.83 AOIs, whereas those in the control group fixated on average 4.53 AOIs. A significant difference was found between the groups (Independent t-test, t (59) = -4.477, p = .000).

Results



Average fixation duration (ms) for the groups.

- For all the AOIs (except AOI 8), a larger proportion of children in the experimental group fixated on aver age the areas longer than in the control group.
- About 86.2 % agree that "it was super fun to cycle with the VR glasses", 75.9 % that "it was really how the Eberg center looks like in reality", 69 % that "it was like to cycle at Eberg". In addition, 93.1 % say that they "cycled in VR as they have learnt during the bike day". Only 13.8 % of the sample agreed that they "felt nauseous and sick during the VR experiment".

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Conclusions

The results showed a significant difference between the two groups, indicating that the new model had a higher impact on the executive functions of the children brain. The fixation time of the experimental group was found to be significantly longer in all intersections than for the control group, which may be an indication that children of the experimental group, had a more planned behavior and systematically better brain collection of information. Children in the experimental group were more satisfied in general with their experience than those in the control group.

References

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