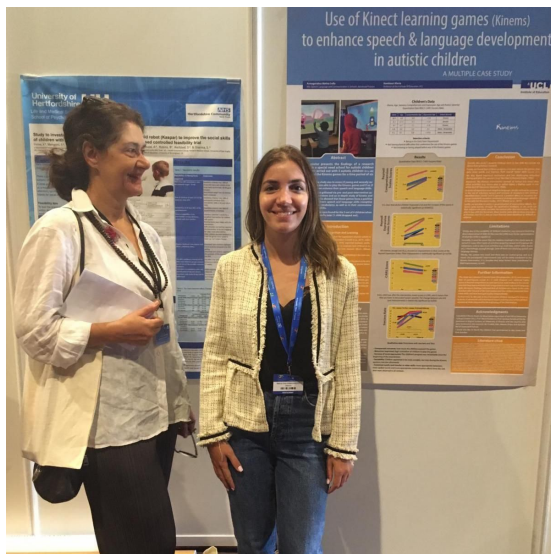


# Can we use digital movement-based learning games to enhance language development in young autistic children?

According to a recent research study, digital movement-based games of the Kinems platform can significantly improve the expressive and receptive vocabulary of young autistic children, while they can improve motivation and challenging behaviors. The findings of this study has been presented at the 12th International Congress of Autism-Europe, organized in cooperation with Autisme France, in Nice from 13 to 15 September 2019.

The study was conducted by two researchers, Dr Maria Kambouri, Associate Professor at City University London- UCL Institute of Education and her former MSc student Ms Melina Sofia Armaganidou who is an experienced speech language pathologist, in order to explore whether Kinems, a movement-based learning gaming platform with the embedded monitoring and reporting system, would have an effect on speech and language, and more specifically on vocabulary development (receptive and expressive).



## Context of Study

During the 10 week period of the study, 5 autistic children aged between 4;01 (y;m) and 8;04 (M=5,63, SD=1,63), enrolled in a special needs school for autistic children. All the participants were boys and their formal diagnosis was Autism. Families of the children have been informed about the research and its goals and have been asked for written permissions. Their comprehension age equivalent ranged between 1;01 (y;m) and 2;08 (M=1,91, SD=0,67) and their expressive age equivalent between 1,09 and 2,03. Students were selected using the following criteria:

- Being in the Early Years Department
- Not having physical impairment that obstructs the use of the Kinems games
- Not knowing or having played before any of the Kinems games

All children's receptive and expressive vocabulary (Reynell test) and autism severity (CARS) had been assessed before and after the study period. In addition, interviews with the teacher and other teaching staff, gave a full picture of each child.

## **Main Findings**

- Improvement in the Reynell Comprehension Scales pre and post-intervention for each child and improvement of the sample's mean value, which increased from 21,4 to 32,2. It is clear that all the children improved a great deal and the increase of the scores is statistically significant ( $p=0,00032$ ).
- There was an improvement in their scores at the Reynell Expressive Scales. The mean value of their scores at pre and post-test improved, ranging from 5,4 to 10. Their improvement is statistically significant ( $p=0.016$ ).
- A difference between the CARS scores pre and post-intervention was also observed. Every child had, after the intervention, lower scores in CARS, which means that they are lower in the scale of autism severity. The change between pre and post measurements is statistically significant ( $p=0.002$ ).
- All the children's success rate improved between the first ( $M=51,46$ ,  $SD=17,78$ ) and the last sessions of the intervention ( $M=86,31$ ,  $SD=10,78$ ). This change is also considered statistically significant ( $p=0.008$ ).
- Teachers commented that gains were not limited only in game-play time, but they were transferable across many activities and interaction opportunities. Teachers were surprised as they noticed some generalization of the intervention effects such as more appropriate behaviours, more spoken words and more appropriate communication efforts from the children in all contexts.

This is yet another study that shows that the active human body via classroom-based learning activities can alter the function of the brain and therefore the cognitive process.