



MARVoc Application

Vocabulary Learning using Augmented Reality for children with Autism



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A-sense Center of Excellence

A world-class center that aims to contribute to **innovative technology enhancement** in the field of autism assessment/intervention through **multidisciplinary research** in the fields of computing, medicine, and education.



A-Sense Center works to **develop technology** that couples the powerful capabilities of AI with state-of-the-art **sensing technology** to enable the **quantitative assessment** drive **personalized therapeutic** and **behavioral interventions** for use in clinics as well as homes, therapy centers and schools for autism and beyond.

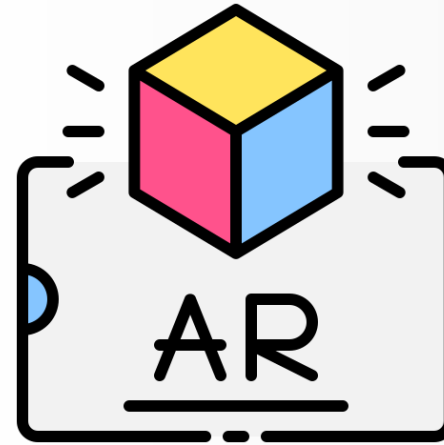
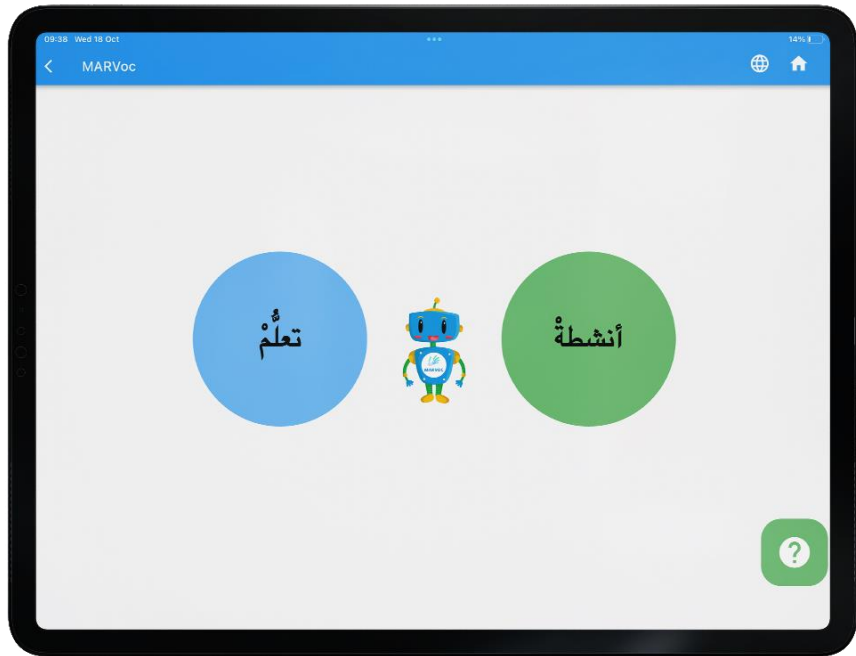


The Center catalyses **multidisciplinary research** and product development, **simultaneously engaging various stakeholders and end-users** (autistic individuals, parents, community activists, developmental specialist, therapists, and educators).



Center will **contribute to the Qatar National Vision 2030** by innovating and producing new knowledge, capitalizing on the center's intellectual properties, and generating potential commercialization opportunities.

Overview



Augmented Reality



Arabic and English
Letters and Words

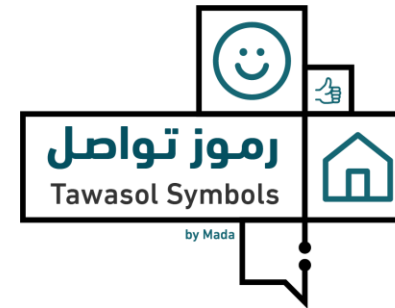
Timeline & Grants



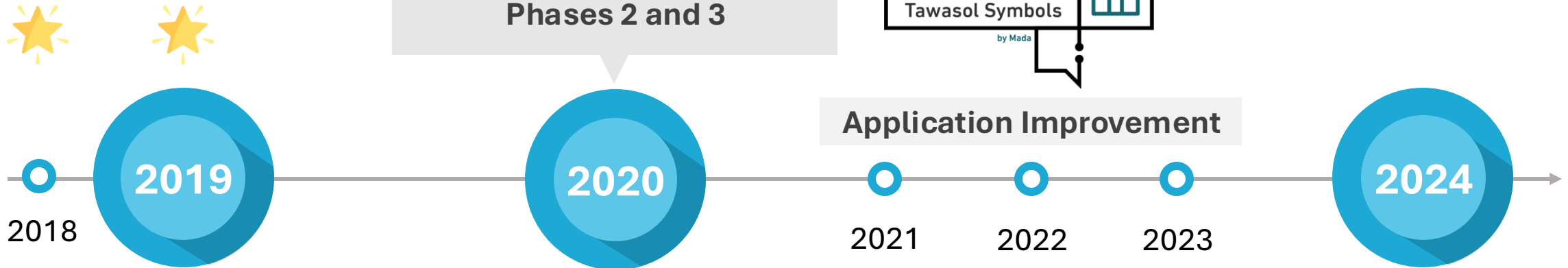
Project Phases

- Application Development
- Workshops with Teachers and Therapists

Phases 2 and 3



Application Improvement



Phase 1

- Requirement Gathering (through interviews)
- Prototype Development
- Co-Design with Teachers

Phase 4

- Feedback from Teachers
- Evaluation with Children
- Deployment at a Center

Publications

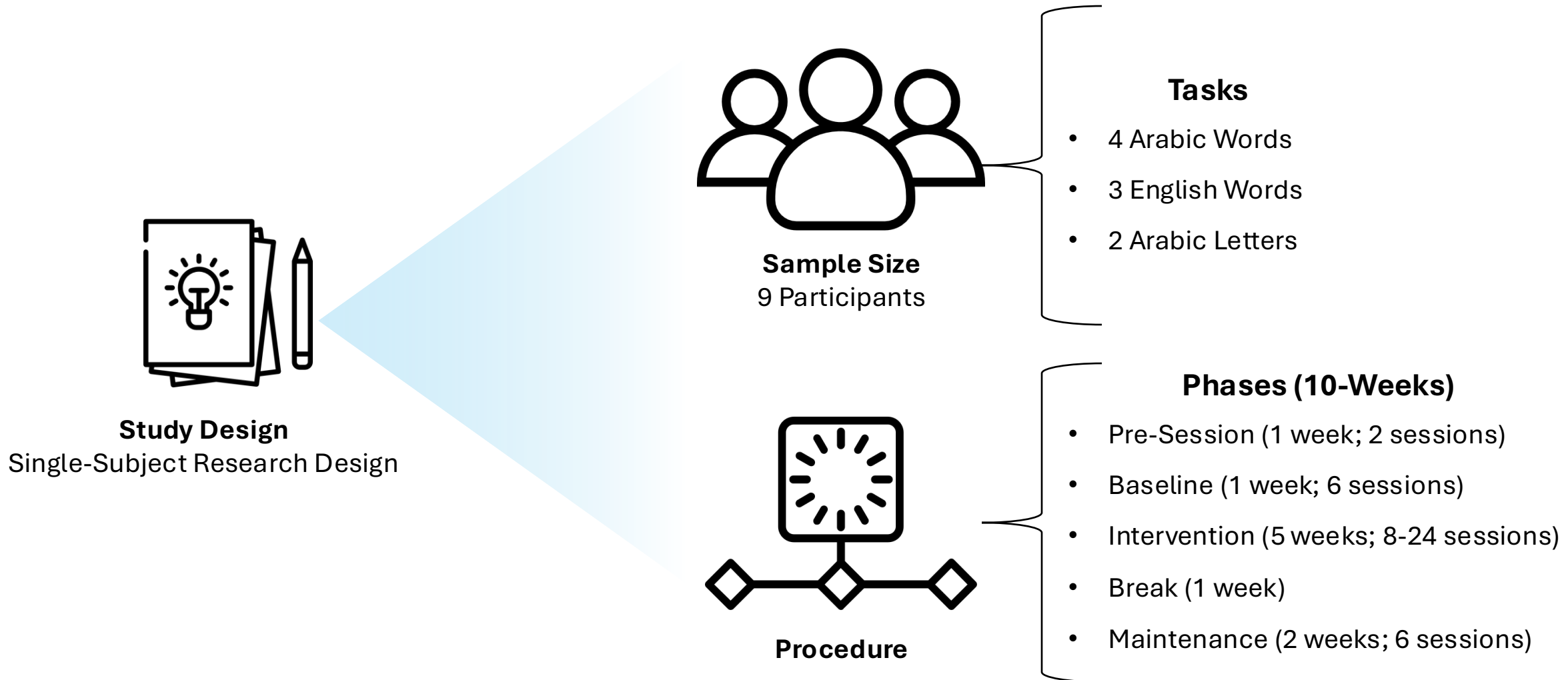
<p>Pathways to learning: exploring the impact of augmented reality on vocabulary development in children with autism spectrum disorder</p> <p>M Bahameish, K Khowaja, Y Abdelaal, D Al-Thani Interactive Learning Environments, 1-24</p>	3	2025
<p>Towards the Mixed-Reality Platform for the Learning of Children with Autism Spectrum Disorder (ASD): A Case Study in Qatar</p> <p>K Khowaja, D Al-Thani, Y Abdelaal, AO Hassan, YA Mou, MH Hijab International Conference on Human-Computer Interaction, 329-344</p>	6	2021
<p>Mobile Augmented Reality App for Children with Autism Spectrum Disorder (ASD) to Learn Vocabulary (MARVoc): From the Requirement Gathering to Its Initial Evaluation</p> <p>K Khowaja, D Al-Thani, AO Hassan, A Shah, SS Salim International Conference on Human-Computer Interaction, 424-437</p>	15	2020
<p>Augmented reality for learning of children and adolescents with autism spectrum disorder (ASD): A systematic review</p> <p>K Khowaja, B Banire, D Al-Thani, MT Sqalli, A Aqle, A Shah, SS Salim IEEE Access 8, 78779-78807</p>	153	2020

Phase 4: Objective

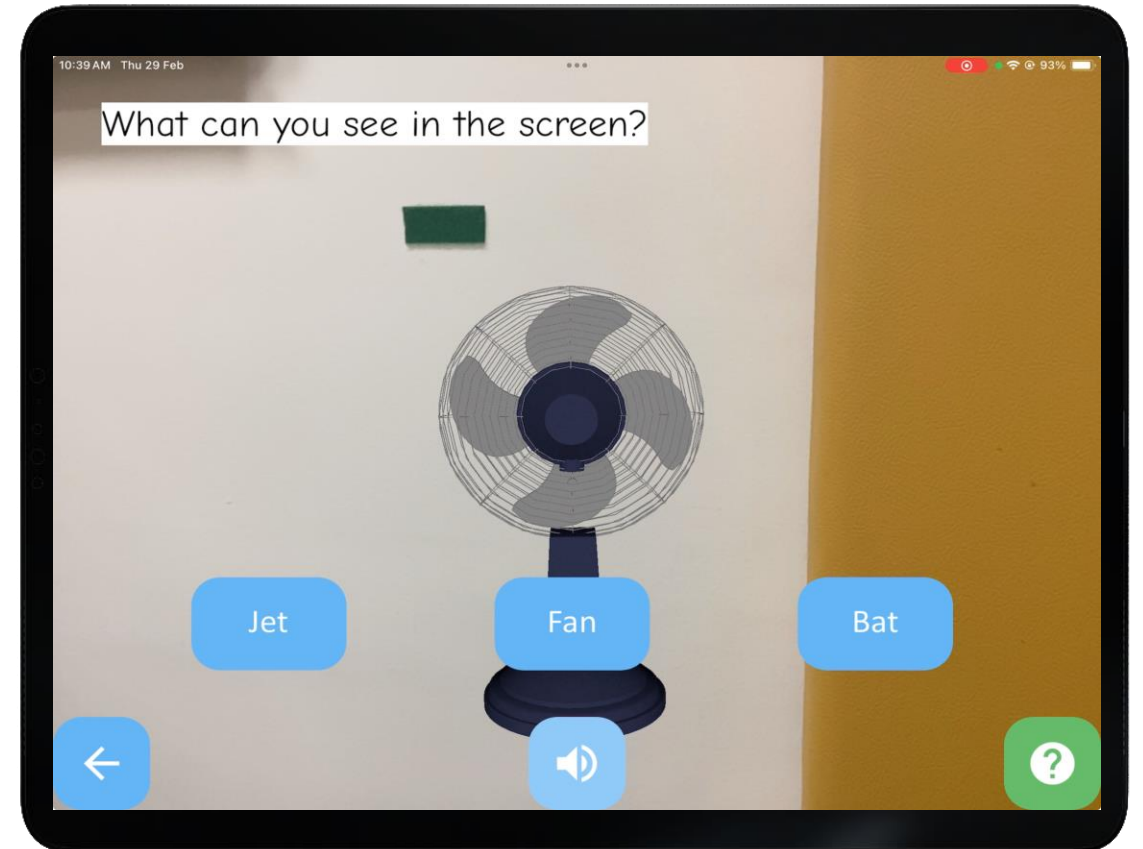
- To assess the effectiveness of using augmented reality technology in improving ***vocabulary learning performance*** for children with autism.



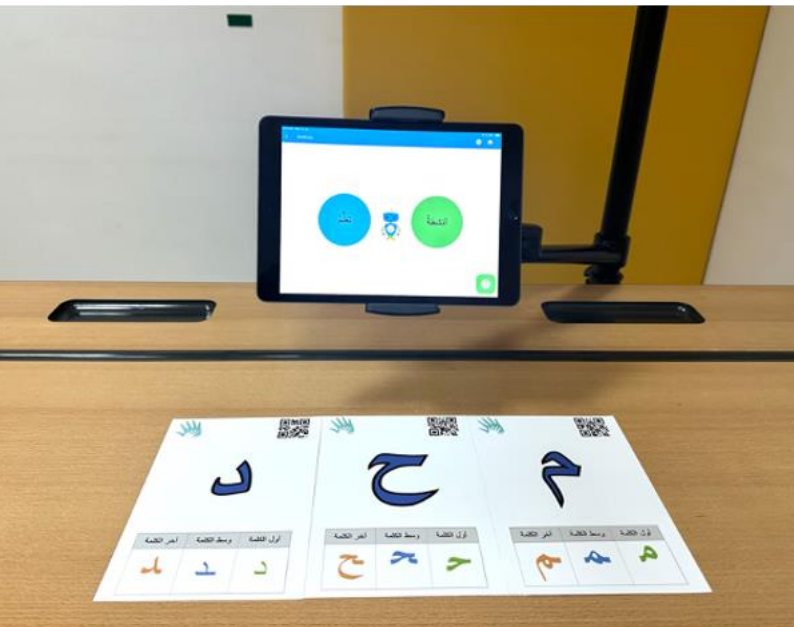
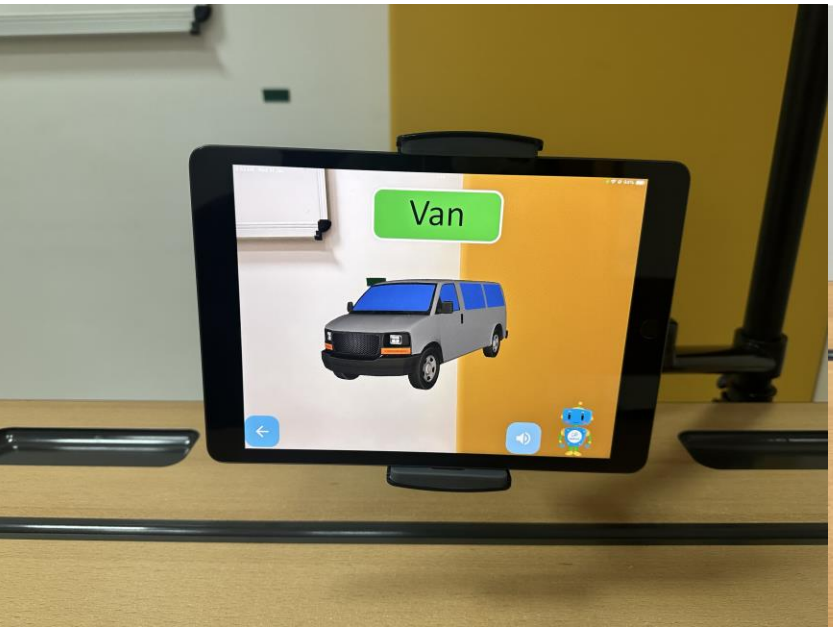
Methods



Intervention Phase



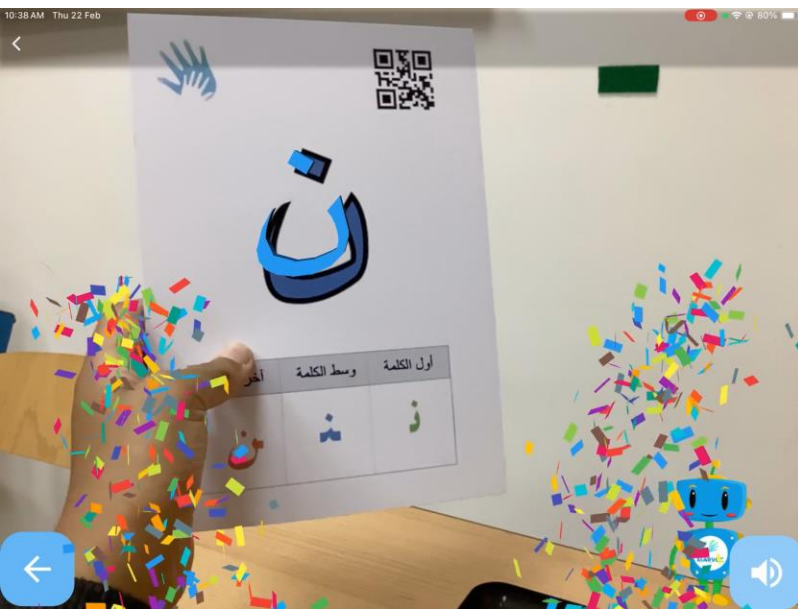
Setup



General Observations



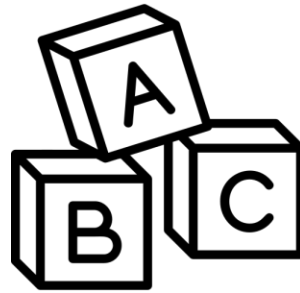
General Observations



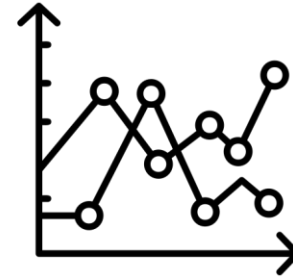
Results



Learning Performance



Vocabulary Retention

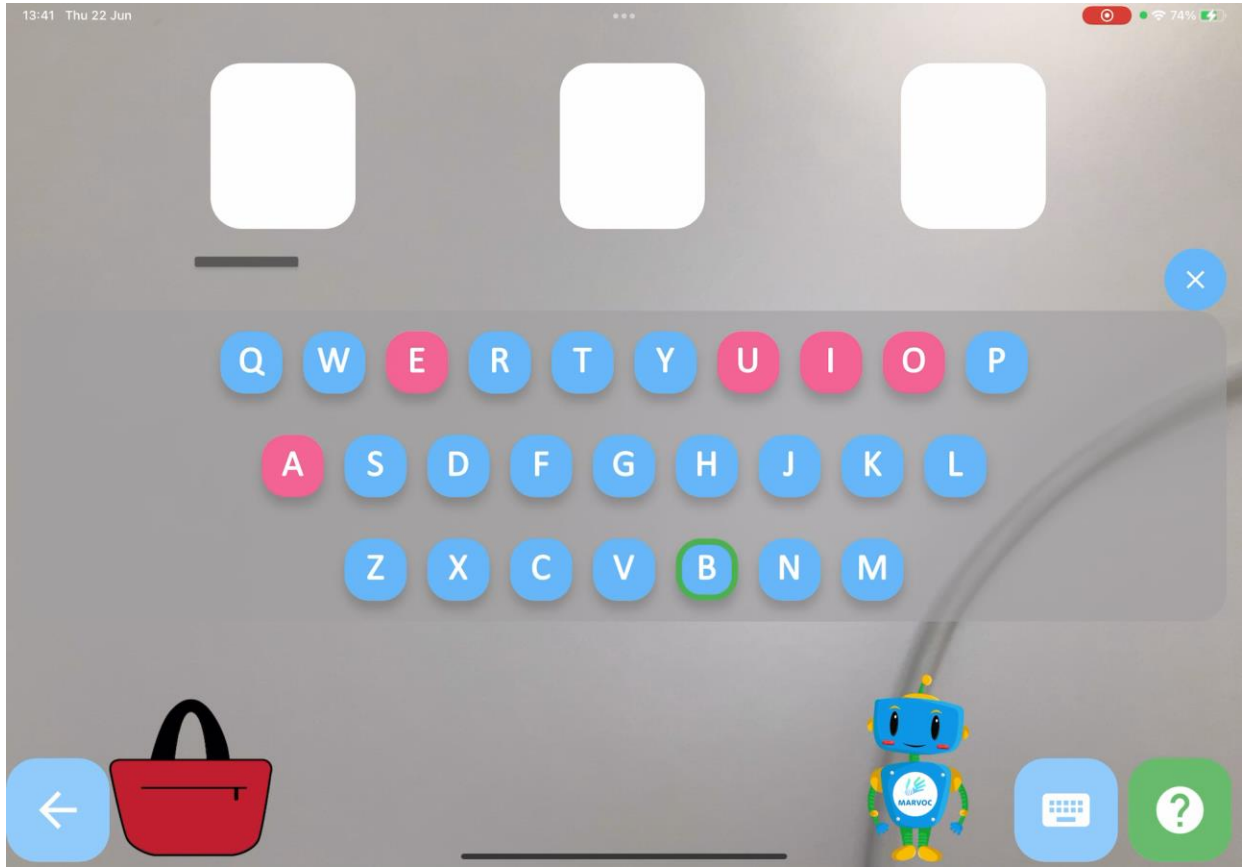


Individual Variability

Demo



Words Learning using Augmented Reality



Project Team

- **Researchers:**

- Dr. Dena Al-Thani
- Dr. Kamran Khowaja
- Dr. Bilikis Banire
- Dr. Mohamad Hassan Fadi Hijab
- Dr. Mariam Bahameish
- Ms. Asma Hassan

- **Software Engineers:**

- Dr. Younss Ait Mou
- Ms. Yasmin Abdelaal

- **Visual Game Artist**

- Shk. Abdelrahman Al-Thani,
Space Crescent Founder

