

**REPOSITORY OF INNOVATIVE PRODUCTS (RIP)
FOR INSPIRATION IN EDUCATION DESIGN
[CATEGORY: PRIMARY SCHOOL*]**

**HandTalk AR cube for Teaching Adjective Using American Sign Language for
Hearing-impaired and Mute learners**

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Highlights: HandTalk AR cube is an integration of doodling activity and Augmented Reality Technology (AR) that may structure learners' attention and let them freely expressed their creativity. It has a special ability to catch children's imagination and promote interest that can help hearing-impaired and mute learners to learn American Sign Language (ASL) in more interactive style. Since ASL is being used widely in most countries, this product help learners to prepare themselves on how to interact using ASL effectively with others globally.

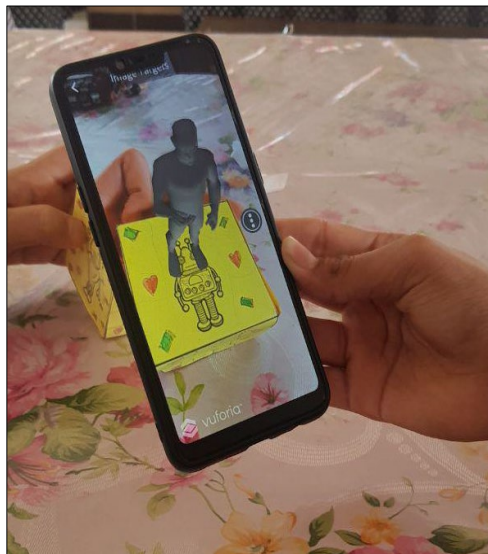
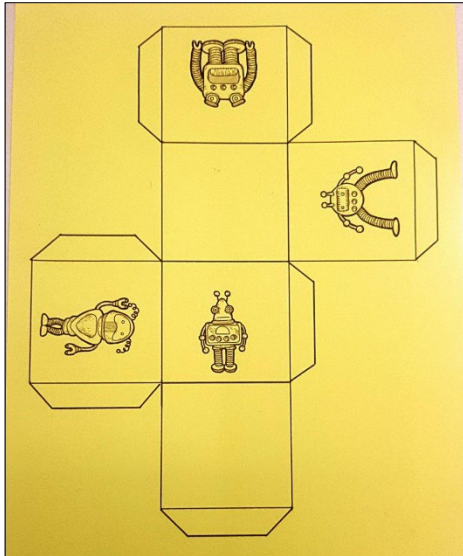
Keywords: doodle drawing; Augmented Reality (AR); American Sign Language (ASL);
hearing-impaired and mute learners.

Product Description

In the recent years, doodle drawing has been widely recognized as a form of visual literacy that improve learning and cognition abilities (Zeyab, 2017). Doodles are simple drawings that can represent concrete meanings or abstract designs. People may draw and design while their attentions are exercised elsewhere. To make learning more interactive, the integration of augmented reality technology (AR) can catalyze major impact for learning process. Bacca et al (2014) emphasized that technology enhanced learning such augmented reality (AR) has become very vital in improving the satisfaction and experience of the users in multimodal learning activities.

In term of the application of HandTalk AR Cube for hearing-impaired and mute learners, the integration of doodling and augmented reality in HandTalk AR cube can help them to be conscious and concentrated during the learning process. Thus, it enhances their interest to learn and participate in the learning session

Product image



Product benefit

We conducted a qualitative experimental method on evaluating the level of participation of hearing-impaired and mute learners during learning session using HandTalk AR cube. The learners have sensory disabilities in terms of hearing and speaking. Among 16 students, there are 12 students with both hearing-impaired and mute, 4 students with severe hearing loss, mute and intellectual disability. The learners divided into two groups of 8 person for controlled and experimental groups. We prepared lesson plan for each group; direct instruction for controlled group and collaborative learning for experimental group. For controlled group, they learned by teacher's demonstration and instruction using flashcard while for experimental group, they learned using HandTalk AR cube in pairs. Since the learners were unable to communicate verbally, we observed their body gesture and face expression to validate the observation. The response has been recorded following the activity arranged in lesson plan.

Results

STEP	CONTENT	ACTIVITIES	ANALYSIS
INDUCTION (5 minutes)	Teacher ask (sign) student to sit properly and greet their friends	<ul style="list-style-type: none"> - Students introduced with sign 'hello' and 'how are you?' by teacher - Students do the sign to their friends in the group 	<ul style="list-style-type: none"> • Learners impersonates teacher sign hello • Smile while doing to their partner • Take turn and repeat sign hello and how are you
STEP 1 (15 minutes)	Doodle on cube activity Teacher show students with images of doodle patterns for doodle on HandTalk AR cube cube activity	<ul style="list-style-type: none"> - Students look into images of doodle pattern and show sign 'good' - Students are given cube layout for doodle on cube activity 	<ul style="list-style-type: none"> • Learner show sign good as the sign of draw and colour is given by the teacher • Student repeatedly make a sign of draw and colour to their partner.
STEP 2 (15 minutes)	Students create their cube in pairs with guidance from the teacher (collaborative learning)	<ul style="list-style-type: none"> - students create doodle on cube based on their own creativity - teacher assist students with low focus and help student to paste the layout into cube 	<ul style="list-style-type: none"> • student take out their stationeries and start the activity with their partners • smile and poke their partner to ask for colours to be used
STEP 3 (20 minutes)	ASL learning Teacher demonstrate the adjective word beautiful using ASL component in HandTalk AR cube <ol style="list-style-type: none"> 1) diagram of ASL (beautiful) 2) comic scene on beautiful 3) video of ASL beautiful 4) animated 3D model on ASL beautiful 	<ul style="list-style-type: none"> - students are given Android handphone to test each component of ASL learning in HandTalk AR cube - in pairs, students impersonate sign 'beautiful' to their partner - students take turn to show the sign to their partner - teacher guide the learning activities 	<ul style="list-style-type: none"> • learners impersonates the sign beautiful using HandTalk AR cube • shows excitement and interest with sign happy (hands up and jiggle) • do the sign beautiful repeatedly with their partner
Closure (5 minutes)	evaluation teacher show the word beautiful on paper	<ul style="list-style-type: none"> - Student shown with word beautiful - Student show the sign for beautiful 	<ul style="list-style-type: none"> • Teacher give rewards in titbits for their participation and one learner who had meltdown • Smile and show sign good

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Category: primary school (special needs education)