Challenge:

Robots are gradually becoming an integral component of our society and have great potential to be used in education. As Singapore lays the foundation for a Smart Nation, it is essential to develop the right skills and instill the right mindset for the young and to prepare them to live in a connected and technology-rich environment. With the continuous advent of robots technology, it is worthwhile to understand the potential of social robots as learning companions to augment teaching and learning in the preschool classroom.

Solution:

The Robots for Early Childhood Education pilot study explores the use of social robots to complement teaching and learning in the preschool classroom. The pilot study was commissioned by the Infocomm Media Development Authority of Singapore (IMDA) in partnership with Softbank Telecom Singapore and NTU Robotics Research Centre. The trial was conducted at two preschools, My First Skool Jurong Point and MY World @ Bukit Panjang which are anchor operators that offers affordable preschool services to the masses.

The 7-month pilot study (from Apr– Oct 2016) aimed to trial the use of social robots in the areas of collaborative play and interactive storytelling. Two social robots were used, Pepper at My First Skool Jurong Point and NAO at MY World @ Bukit Panjang. During the pilot study, use cases, lesson plans and robot applications were developed. Teachers were also trained to facilitate the lessons with the use of robots throughout the trial period.

Observations were recorded for each lesson at the individual student-level and also at the class-level. At the individual student level, attributes on cognitive, creativity and social & independence were captured. At the classroom level, the classroom management, classroom atmosphere and the class-level behaviour were also captured. These forms important data points for the future development of lessons and robot applications. The usage scenarios, challenges and considerations, as well as the benefits for preschool children, the teachers and the preschool centres were also documented which provide important insights for the future curriculum design in the use of social robots for the early childhood sector.

Learning Impact Outcome:

As this is a pilot study, about 50 preschool children aged 5-6 and 6 preschool educators from 2 preschools have benefitted from this exposure. The results from the observation show that the social robots help elicit the behaviour desired from preschool children and it scored highly for the attributes observed. For classroom management and the atmosphere, the robots also impart a positive experience for the teachers and students alike. A post trial survey from the parents shows:

    a) 74% - in favour
    b) 24% - neutral or unsure
    c) 2% - not in favour

Existing trends are already pointing towards robots co-existing within our society and the data collected about the students and from the educators, parents and observers show that having robots would help augment teaching and learning in the classroom and further prepare them for the digital age. Data and observations collected in this pilot study also helps validate and paves way for the development of future lesson designs.

ROI

This pilot study was first announced to the public at the imbX 2016[1] and was featured by many mainstream media. The results of the pilot study were shared in the Early Childhood Conference 2016 and the EduTech Asia 2016. Beyond the pilot study, the social robots were also trialled at the regional libraries through the early literacy programme, which further expand the exposure to another 80 young digital natives. The data collected forms an important reference for the planning in the next phase for a larger scale adoption to other preschools and community programmes.

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[1] https://youtu.be/40yzaGB720k