



International Conference on Robot PRIDE 2013-2014 - Medical and Rehabilitation Robotics and Instrumentation, ConfPRIDE 2013-2014

## Humanoid Robots For Skill Augmentation Of Gifted Children: Teachers' Perceptions and Islamic Implications

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### Abstract

Malaysia is experiencing the use of robots for therapy, rehabilitation and skill augmentation in healthcare and wellbeing. Although in its infancy, trepidations, reluctance and apprehension have been the responses to robots taking over humans. In the case of education of brain-impaired children, the parents and teachers of these gifted human beings, the introduction of humanoids for social skills training have been met with the same perceptions. The findings were derived from the qualitative analysis and case study that was conducted at a special-education primary school located in Shah Alam, Selangor, Malaysia. Through interviews with the teachers at the special-education classes, they are of the opinion that the gifted children still need a fellow human being to look up to rather than a "big toy". Physically, the teachers look different and the children are able to attach a name to their teachers unlike robots that look the same anywhere. They opined that the human touch far exceeds that of robots, no matter how close the physical resemblance the robots are to a human being. Moreover, the cultural and religious elements exceed the robot's capability in skilling and preparing these special-needs children for their adult life and independence. Also, the emotional and spiritual aspects cannot be replaced by robots. Hence, the findings evidenced an intense emphasis on cultural and religious values for these students with similar implications. No matter the positive reports on the use of robots in developed nations, cultural mores, tradition, ethics and the Islamic faith are more important to these gifted children than modern technology. © 2014 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/3.0/>).

Peer-review under responsibility of the Center for Humanoid Robots and Bio-Sensing (HuRoBs)

*Keywords:* Humanoid robots; gifted children; culture; religion; Islam;

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## 1. Introduction

Modern science has not gone unnoticed by developing countries where religion plays a key role in internalizing an individual's citizenship and cultural values. For Malaysian scientists, keeping up with the latest technology on health, medicine and therapy are keenly scrutinized for benchmarking and replication. In the case of gifted children, those living in the metropolitan areas have a better advantage than their peers from the rural areas. Centers of learning for these special-needs children are available but with high fee structures. Nevertheless, realizing the economic inequity among parents with gifted children, the Malaysian government, through the Ministry of Education has set up integration classes for the special-needs students at most primary schools in Malaysia. The funds for these disabled population has always been included in the country's annual budget, for example, the allocation for 2014, as tabled by the Prime Minister Najib was, 441 million ringgit (Razak, 2013). Consequently, the number of gifted students from less affluent families should grab the opportunity to send their children to these special classes.

Anyhow, scientific discoveries on artificial intelligence and robots for medical rehabilitation have been on the forefront of hospitals, care outlets and clinics throughout the world (Foerst, 1999, Geraci, 2007) particularly in developed countries. In the education sector, robots or *lingodroids* (Ackerman, 2011) have displaced teachers, for example in language training (Matsuzoe and Tanaka, 2013). These cases showed that robots do serve their purpose in various assistive areas for man. The main reason for such replacements is shortage of trained expertise (Jordan et al., 2013). In his study on language training, for example, Matsuzoe and Tanaka (2013) found that children showed immediate affinity to humanoid robots and the learning experience is not asynchronous. Setting these cases as precedents, our research project will investigate if teachers are willing to have robots as their assistive peers and the religious implications of using a human-like robot in structured school.

### 1.1. Background

The motivation for the study emerged from two sources: brain or neuro science and robotics. These niche areas reside with the Faculty of Pharmacy and the Faculty of Mechanical Engineering, Universiti Teknologi MARA, Shah Alam, Selangor. Through their various studies, several areas of social science were included to reinforce fundamental knowledge on the use of humanoids to encompass brain-impaired children. Henceforth, brainstorming sessions as well as rigorous literature ferreted resulted in the novel area of Islam, the religion being integrated into the social skill training of the brain-impaired children, specifically, those who suffer from autism. Realizing that brain impairments come in various degrees or stages, the study sought to focus on lesser affected impairments such that, only mildly autistic children and those with attentive disorders, including slow learners and dyslexic ones are concentrated on.

Henceforth, primary schools in Malaysia were the scope for the study but for this occasion, and as a preliminary research, the Raja Muda Primary School was chosen. There are two reasons for this. Firstly, the school is located close to the research lab and secondly, there is an adequate number of students and teachers in the integration classes for students with such mental disabilities.

## 2. Literature Review

### 2.1. Humanoid Robots for Therapy

As noted in the introduction, the use of humanoid robots particularly in the healthcare field is not new. The past decade has seen escalating cases reported on humanoids for rehabilitation after a stroke (Jung et al., 2012), physiotherapy for the elderly (Yamazaki et al., 2012), and now for children with various physical and mental disorders and disabilities (Bekele et al., 2013, Dickstein-Fischer et al., 2011, Howlin et al., 2009, Soares et al., 2013, Robins and Dautenhahn, 2014).

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