Using Assistive Technology for Spiritual Enhancement of Brain-Impaired Children

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Abstract

The purpose of this paper is to evaluate the feasibility of using assistive technology for spiritual enhancement of brain-impaired children. The assistive technology in this case is the humanoid robot. A qualitative approach was employed where the sample size was twenty teachers based at a special education primary school in Shah Alam, Selangor, Malaysia. Data were collected through interviews using a semi-structured interview guideline. From the analyses of the interview transcripts, the findings suggested that the teachers are optimistic on the use of humanoids to enhance the children’s spiritual or religious knowledge, in particular, the repetitive motions in praying and memorizing the verses from the Quran. It is important to note that the teachers and school children are all of the Islamic faith. Although the study suggests a positive influence of humanoids for spiritual enhancement, more research is needed in this area to provide empirical evidence on assistive technology for brain-impaired children, especially those suffering from autism.

Keywords: assistive technology; pedagogy; spirituality; Islam; brain-impaired children

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1. Introduction

In the Information Era, religion continues to play a significant role in the upbringing of brain-impaired individuals, particularly citizens from developing countries. Moreover, religion and spiritual beliefs have been the defining factors of coping among families that have children with disabilities [1]. For example, in Malaysia, religion continues to play an important role among the three major races; Malaysia, Chinese and Indians. Having a child with disabilities require families to divert to the spiritual well-being as a coping resource including internalizing the religious values to the child. In doing so, both the parents and teachers are involved in teaching the various religious practices especially in prayers.

With that in mind, ensuring that prayers are performed and recited correctly require repetitive activities; more so for brain-impaired children. For this study, the majority of the students and teachers at the integrated special education program are of the Islamic faith. Hence, there is affinity in religious values. Nonetheless, in guiding these special children to perform the five daily prayers and recite the Quranic verses correctly require every day, repetitive coaching. However, that is not possible as classes are conducted every alternate day or twice a week. When at home, the children turn to their parents for these repetitive coaching. Again, the progress on each child’s spiritual internalization depends on the frequency of the activities. Besides that, the parent or teacher has to be patient as progress is slow [1].

With many, significant developments in assistive technologies, in particular, robotics, it is expected that human-like robots or humanoids will be the apt assistive technology in cases of pedagogy for brain-impaired children. Furthermore, a positive outlook on the resemblance of the physical structure of the robot to humans promotes a preference for humanoid robots and a future in which robots serve human beings [2].

2. Methodology

This study employs a qualitative design as rich, in-depth data are needed to answer the research questions and attain the objectives [3]. As such, interviews were conducted on a pre-determined sample where the units of analysis are the teachers (n=20) working at the integrated special programs of SRK Raja Muda, Section 4, Shah Alam, Selangor, Malaysia.

The sampling technique used for this study is non probability sampling or more specifically, purposive sampling. Only one criterion is used, that is, a teacher at an integrated special program class.

Nevertheless, the qualitative method requires interviews to be conducted on the teachers. A structured interview guideline containing 10 open-ended questions were posed to the teachers. The interview was limited to 10 minutes for manageable transcription. This principle is based on the fact that the longer the interview, the transcription time would be two times more [4]. In constructing the interview questions, firstly, the researcher had some initial guiding questions or core concepts to ask after extensive literature review. There is no formal structured instrument or protocol but the use of common sense to break the ice is a practical choice before posing the first question. In using a structure interview guideline to gather data, there are times when the researcher or interviewer is free to move the conversation in any direction of interest that may come up [4].

Anyhow, another unique element to this project is the case study employed. As recommended by Trochim [4] and Babbie [3], a case study is an intensive study of a specific context, which, for this project is the integrated special program at SRK Raja Muda. Moreover, in the conduct of a case-oriented study, the interview method is considered appropriate [4]. Aside from this, the inductive reasoning allows for the discovery and confirmation of a set of patterns [3].

As for the analysis of the transcriptions, coding method was used. In analyzing the transcriptions line-by-line, the ten interview questions provided the tentative themes on spirituality feasibility and enhancement.
3. Analyses and Discussion

From the 20 sample size of the teachers selected to be interviewed, only seven were formally met. This is because saturation of data were reached at the seventh respondent. In other words, the seventh interviewee related similar feedbacks to the other six respondents. Putting a halt upon attaining data saturation is in accordance to the principles of qualitative research [5] in a case-oriented study [3].

For the first question on whether the interviewees are aware of an assistive technology in the form of humanoids, three of the teachers said no while the other four have seen the robot Nao (humanoid) (see Fig. 1) on television. Upon showing a picture of a Nao robot, the teachers nodded in comprehension. Hence, it can be assumed that the teachers have, at one time, come across the humanoid. They also requested that an actual Nao be brought to the school to show to them and the students.

On the question if humanoids could replace teachers to educate the children on the enhancement aspects of the Islamic religion and spirituality, a two-prong opinion was recorded based on the understanding of each teacher. Firstly, all the respondents are pessimistic on this idea particularly as prayer performance (how to solat (pray), recitations of the verses from the Quran, ablutions, etc) cannot be compromised in terms of correct actions and enunciations. Nevertheless, some basic movements for early practice and enhancement that require repetitive acts can be done using the robot Nao, say in six years’ time when Malaysia achieves the developed nation status. Meanwhile, all the teachers concurred that robots cannot take the place of teachers. Two of the interviewees gave examples of the compassionate nature of a human being. For instance, if the student falls down and hurt his or her knee, a robot in incapable of pacifying the crying child. In other words, a robot is devoid of emotion and would not be able to sense a child’s needs, let alone a mentally impaired one.

Another important matter that the teachers asked is the size and height of Nao. When informed that Nao is less than three feet tall, the teachers’ expressive faces evidenced further pessimism. All of them opined that the size of Nao may work against teaching the mentally impaired, school children in the integrated programs. The children may think that Nao is a toy for them to play with, and for those with severe autism, for example, Nao may be physically abused. When informed that Nao can move like a human child, again, the attraction to the robot may remain as that of a big toy and fit as a playmate.

On a specific question whether the robot Nao could assist with the memorizing of short, daily, prayer-based verses from the Quran, the teachers concurred that as a preliminary foundation, the robot Nao may assist with the repetitive nature of memorizing the verses. The important issue here is grabbing the children’s attention, hence, it is expected that the children may pay attention to the robot Nao for less than ten minutes; the reason being that Nao may stand stationary and the recordings are played back. This will make the session a dull one after 10 minutes and the children may lose interest. Ironically, even a normal child may not take to the robot Nao if it stands inactive for more than 10 minutes.

The teachers were also asked if the school is willing to purchase the robot Nao in assisting them with educating the disadvantaged children. All of them wanted to know the price of the humanoid - which comes to about 80,000 Malaysian Ringgit (~USD$22,000). Upon realizing the expensiveness of the robot, the teachers tactfully responded that if there is a mandate from the Ministry of Education, and that all costs are borne by the Ministry, then they are willing to adjust to the situation. Again, five teachers cautioned the size of Nao - that would be the main barrier to learning and spiritual enhancement among the primary school students at the integrated special program classes.

All in all, in discussing the feasibility of using this particular assistive technology, the humanoid robots, in the enhancement of the Islamic religion and spirituality among brain-impaired children, several important aspects have to be considered. Foremost is the religion itself. Practicing the teachings of Islam is a serious endeavor; there should not be any shortcuts in ensuring that the faith and piety are diligently followed according to the Quran. Second is culture. As all the respondents are Malays and most of the brain-impaired children at the school are of the same race, culture is also guided by the religion, Islam. In cultural values, the aspect of social justice inherently became the catalyst to the success of spiritual enhancement of the children using technology [6] with underlying ethical implications of individuals with various brain impairments [7] [8]. In this case, the Malay culture is tightly aligned...
with Islam, henceforth, in using humanoids, the fact that the resemblance of the robot to a human being will be the initial impediment [9] because of the possibility of idolatry. Nevertheless, these are debatable depending on the individual’s perspectives and religious affinities.

Additionally, it is without a doubt that in most developing nations in Asia, the formative and spiritual relationships among children are important in shaping the child’s spiritual base [10]. Religion is still the “opiate of the masses” [11], particularly in the South East Asia. As such, special considerations and attention have to be made with introducing an assistive technology such as the robot Nao, to a social institution where the cultural expressions of the religious community are ingrained through the Islamic religion.

4. Conclusion

Based on the analyses of the feedbacks from the teachers at the integrated special program classes, it can be concluded that the robot Nao can be used for spiritual enhancement activities in the future. For now, it is not a feasible practice because of cost and acceptance. Besides that, culture and religion are the reasons for non-acceptance. With that it is recommended that a precautionary principle be in place because the subjects (the brain impaired children at the integrated programs) are minors. No doubt, the intrusion and replacement of a divergent scientific strategy is helpful in some cases, but they cannot be separated from the religious worlds of their adopters and practitioners.

Fig. 1. Humanoid Robot Nao in prayer position (Source: HuROBs, UiTM, 2015)

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