

## Chapter 8

# Support of Gamification, Virtual, and Assistive Technologies in Intervening in Social and Behavioral Impairment

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### **ABSTRACT**

*Neurodevelopmental disorders (NDDs) compromise the development and attainment of full social and economic potential of an individual. Technological intervention can play a big role and is capable of reducing the cost of present medical intervention. Games based on daily life activities can play big roles in improving social skills. One can easily customize games as per requirement or as specific to particular social skills for children to improve their respective social skills. Children find it easy to associate with these games since these games involve scenes related to their daily routine and don't involve any complex set of rules to be followed. Even parents, family members, and teachers can also help in playing these games at an initial level without any need for specialization or special training.*

### **INTRODUCTION**

Neurodevelopment is inter-association between various developmental functions like cognitive, emotional, sensory, social, behavioral functions and further, it also includes functional activities related to brain and genetics across the lifespan of an individual. Intrusion to above inter-association through genetics problems or due to environmental consequence can lead to abnormalities in performing above function which is one of the main cause of neurodevelopmental disorders.

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## ***Support of Gamification, Virtual, and Assistive Technologies in Intervening in Social and Behavioral***

Neurodevelopmental disorders (NDDs) are classified as a class of untimely disorders related to neurology, which includes intellectual disability (ID), Asperger syndrome (AS), autism spectrum disorders (ASDs) and disorders related to sensory, social, language, behavioral, cognitive and emotional disorders, etc.

In the last decade, there has been a significant evolution of technologies, high increment in data computational and processing capacity, and new discoveries in genetics fields have helped us to understand mutations activities that are related to neurodevelopmental disorders, which can be helpful for developing a treatment for such disorders. But as much has been not done in early intervention technologies since it does not involve big corporate, industry or MNCs in this field hence lack of resources and funding.

Neurodevelopmental disorders (NDDs) lead to a lack of social, behavioral and economics potential development of an individual in which one is capable. Technological intervention can play a big role and is capable of reducing the cost of present medical intervention.

Games based on daily life activities can play big roles in improving social skills. One can easily customize games as per requirement or as specific to particular social skills for children to improve their respective social skills. Children find it easy to associate with these games since these games involve scenes related to their daily routine and don't involve any complex set of rules to be followed. Even parents, family members, and teachers can also help in playing these games at an initial level without any need for specialization or special training.

Kinect based games use body movement as input by using a line of motion sensing sensor hence making interaction with game comfortable and playing game enjoyable since it did not involve extra devices to be connected to the body making it effective for children with Neurodevelopmental Disorders (NDDs). Microsoft Kinect based game can be played by hand movement, thus reducing the need for any physical input tools, gadget or any medium like mouse, virtual reality system, smart glasses, eye gaze tracker, video recorder, laser rangefinder, image recorder, scanner, joysticks, trackball, etc to be attached on body. Hence it can be easily used by children with Neurodevelopmental Disorders.

Kinect based games can enhance not only motor and sensory skills but also Social, Cognitive and Behavioral skills, which can help children with Neurodevelopmental Disorders in performing their daily life routine efficiently. If one can provide proper training and intervention regularly to children with Neurodevelopmental Disorders using Microsoft Kinect games based on daily life routine, definitely we can see improvement in their confidence while performing such activities and enhancement in their Social, Cognitive and Behavioral skills.

## **BACKGROUND**

The present studies provide good evidence of the children with NDDs and their parent's satisfaction with technological intervention. However, findings should be interpreted with caution, more studies are important for better understanding of the Microsoft Kinect based games effects on NDDs patients in general. Some of the research work and different technologies and their potential use in support of gamification, virtual and augmented reality and WebPages in intervening the social and behavioral impairment have been discussed below:

The exploration of benefits which can be achieved through video games in various fields like social, medical, education and rehabilitation have been fired up in last decades, and one of the main reason for that is the irresistible interest of children in video games. Playing video games leads to an increase in

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