

Harnessing ICT to support the learning and interpersonal relationships of hospitalised children simultaneously: remote learning support for hospitalised children using avatar robots

Tottori Prefecture



Background to the Project

Using robot technology to support both the learning and construction of interpersonal relationships for hospitalised children simultaneously

Tottori Prefecture is endeavouring to enhance the education of children with disabilities in a manner appropriate to their individual situations by enhancing medical care systems and implementing education through home visits.

However, in the case of hospitalised children in particular, learning in groups is often difficult and largely restricted, for reasons such as limitations on movement and the need to avoid the risk of infection. Consequently, opportunities for forming values and concepts that are born through interacting and learning together with other children may be limited in some cases.

In order to encourage the development of each child as much as possible, even in environments such as this, and increase the possibility of their being able to participate in society, Tottori Prefecture is endeavouring to enhance education focusing on the potential of ICT—and robot technology in particular—from the perspective of supplementing not only children’s lessons but also their interactions with other students.

Project Aims

Through interactive remote education utilising ICT devices and robots, the project aims to enhance hospitalised children’s education by supporting both their learning and construction of interpersonal relationships.

Project Outline

Providing support for hospitalised children’s smooth return to school by having “Avatar Robots” participate in school lessons and activities on the children’s behalf

1. Schoolchildren who are hospitalised or recuperating at home for a certain length of time are loaned “OriHime,” a remotely operated robot model developed for healthcare/nursing care purposes. By connecting the children with their school and other schoolchildren through OriHime, the project aims to construct an environment in which the hospitalised children can share everyday conversations, activities, and experiences with their classmates.
2. Supplying “OriHime” to special needs schools and hospital schools in which the hospitalised children are enrolled enables the children to participate in general classes with their classmates.



OriHime

Features and Innovations

Supporting both the learning and construction of interpersonal relationships for hospitalised children simultaneously

1. Learning support classes

As the hospitalised child's avatar, the robot enables the child to proactively participate in classes by raising their hand and commenting.

Firstly, "OriHime" robots are placed in the classroom and the hospitalised child uses an iPad to participate in interactive remote learning.

Through OriHime's movements, the child is able to not only see and check what is happening in the classroom, but also raise their hand or comment, proactively participating in the lesson.

Furthermore, because "OriHime" can also be taken outside the classroom, it is possible for the child to virtually experience learning activities outside the classroom as well.

2. Supporting construction of interpersonal relationships

Endeavouring to deepen children's interpersonal relationships with other children through two-way communication that does not stop at words

Because "OriHime" can not only emit sounds but also move, the robot enables deeper conversation that does not stop at words and deepening of human relationships can be expected.

Furthermore, in addition to being directly operated using an iPad, the robot can also be operated using eye gaze input, enabling it to be used in whichever manner is most appropriate for each child.

Results of the Project

Both the hospitalised children and users/those in the classroom feel that communication has been strengthened, and use of avatar robots has also been an effective measure against COVID-19.

At special needs schools, while remote classes had conventionally been held via video communication apps using tablets, changing the device from tablet to robot enabled

hospitalised children to perform actions such as raising their hand in class and shifting their gaze in the direction they wish to look, thereby proactively participating in class activities. Additionally, the use of avatar robots tremendously expanded the potential for virtual experiences, something that was difficult to do using tablets.

Furthermore, the actions of "OriHime" increases the presence in the classroom of the hospitalised child for the children in the classroom, and even in situations where exchanges were difficult to achieve just with sound, the robot's actions made it possible for the child to indicate their intentions/wishes, giving both sides a sense that communication was being strengthened.

In 2020, as a measure against the spread of COVID-19, children with underlying medical conditions who are unable to attend school were able to participate in classes and other school activities via "OriHime."



Issues and Responses

Because this is a new initiative, continued verification testing as to its effectiveness as an educational method is necessary.

Since the project was implemented in advance of other local government bodies, detailed information about the project's results and issues that need to be addressed are presently being compiled, and in the future will continue to be catalogued and shared by a verification committee.

Future Developments

By effectively utilising avatar robots in accordance with the degree of each child's disability, the project aims to further expand and spread their use.

In particular, eye gaze input enables children with a high degree of physical disability to see things using the robot as their own eyes, as well as alleviate the difficulty of vocalising or making sounds, providing an extremely effective method for proactively connecting the children with society.

It is felt that the continued use of avatar robots has the potential to lessen these children's social disabilities. Accordingly, Tottori Prefecture intends to establish effective methods appropriate to the level of each child's disability and expand the scope of the use of Avatar Robots, tying these activities to children's nurturement that further connects them to society.

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Key Terms

◆OriHime

A remotely operated robot developed for use in healthcare/nursing care, "OriHime" is equipped with a microphone, camera, and speakers, enabling users to hear sound and see images remotely through "OriHime". Conversely, users can also convey their own voice through the robot. Furthermore, "OriHime" can also move its neck and hands to "nod", "clap", and otherwise demonstrate the user's intentions, conveying a "sense that that person is right there".

◆Special Needs Schools

These are schools that provide children with disabilities with education equivalent to that provided by elementary schools and junior high schools. Special needs schools also aim to provide children with disabilities with the knowledge and skills necessary for them to overcome the difficulties they face in learning and in their everyday lives due to their disability and gain independence.