Critical analysis of the potential of social robotics in higher education for the management of illness and bereavement

Laia Riera, Francisco José Perales, Francisca Negre
Universitat de les Illes Balears, Spain.

Abstract

Social robotics and the use of information and communication technologies have a significant impact on education. This approach combines robotics and artificial intelligence with a social and emotional perspective to improve the quality of education while providing psychoeducational and emotional support to students. This critical analysis aims to discern whether these technologies, together with inclusive and quality teaching strategies and organisational strategies adapted to each centre and classroom, can enable the presence in class during periods of hospitalisation and/or convalescence of seriously ill students, and facilitate their participation and progress, as well as allow for better accompaniment during the bereavement of the class if this colleague dies. The advantages of these technologies are highlighted as tools of great value in the inclusion and integration of these students during higher education, although it is true that it is essential to carefully assess the advantages and disadvantages before implementing them.

Keywords: Benefits; drawback; artificial intelligence; telepresence; teacher; classmate.

1. Introduction

Social robotics and the use of information and communication technologies (ICT) in higher education are of great importance in the field of education. This approach combines robotics and artificial intelligence (AI) with a social and emotional perspective to improve the quality of education and support students (Belpaeme et al., 2018). In particular, for students facing limiting illnesses, social robotics and ICT can be valuable tools to help them stay connected and participate in their education effectively (Belpaeme & Tanaka, 2021).

According to Johal (2020), social robotics can enhance student engagement and learning in higher education by offering a more personalised and enriching experience. Furthermore, the combination of ICT with social robotics allows students to access online learning resources and materials in real time and from anywhere (MAarell-Olsson et al., 2021). According to the authors, these resources provide a unique opportunity to enhance education and provide support for students with limiting illness, allowing them to remain present in the classroom without being physically there. It is not just a computer screen, but the social robot gives a physical and corporeal presence to the student who for health reasons cannot be in the classroom. This innovative and emotional approach can help students stay connected and actively engaged in their education, despite any challenges they may face. This research aims to discern from already published contributions whether these technologies, accompanied by inclusive and quality didactic strategies together with organisational strategies adapted to the characteristics of each centre and classroom, can make possible the presence in classes during periods of hospitalisation and/or convalescence, as well as facilitating the participation and progress of students with serious health problems.

The use of social robotics in higher education for students with limiting illnesses and difficulties in attending face-to-face classes is justified by its ability to enable classroom presence, improve accessibility, encourage participation and, ultimately, provide an inclusive context for students with serious health problems. In addition, in the case of a palliative illness and possible death, the robot allows classmates to say a final farewell with an appropriate farewell. The acceptance and gradual farewell of fellow students with the student in a palliative illness situation through the presence in the classroom of the figure of the student who no longer exists avoids the empty chair syndrome by peers and normalises the end of life, eliminating taboos and associated fears (Riera & Ruiz, 2021). However, it is necessary to evaluate all the elements involved in the use of this particular type of technology in a classroom. To this end, a critical analysis article is carried out in order to evaluate and analyse the existing contributions on the subject. The resulting research question is: What are the uses, advantages and disadvantages of digital technologies and social bots in higher education for students with a limiting illness?

2. Literature review

With the great advances in technology, social robots have become a useful tool to help these students overcome physical barriers and participate in school activities (Newhart & Olson, 2017). Social robots are electro-mechanical devices programmed to interact with people and help them meet their needs. In the case of students with limiting conditions, social robots can be used to provide a presence in the classroom and keep them connected to their peers and teachers (MAarell-Olsson et al., 2021), which has positive implications in terms of accessibility and inclusion (Belpaeme et al., 2018). For example, social robots can be programmed to deliver classroom presentations, participate in group discussions and activities, and provide ill students with the opportunity to interact with peers and teachers in real time (MAarell-Olsson et al., 2021). In addition, social bots can also help students with limiting illnesses to keep up with their school work and receive instructions and feedback from their teachers. Not only do they provide educational advantages, but social robots can also provide emotional support to students with limiting illnesses (Newhart & Olson, 2017).

However, it is important to note that the use of social bots in education should be a complement to and not a substitute for the care and support of teachers and other educational professionals (Belpaeme & Tanaka, 2021). The use of this technology for students with limiting illnesses that prevent them from attending face-to-face classes can be a valuable tool to help them overcome physical barriers and stay connected to their peers and teachers, although there are a number of legal and ethical issues to consider (Powell et al., 2021). Telepresence robots can also improve efficiency in classroom management, enabling better coordination and communication between students and teachers. This can result in a better learning experience for all students, not just those who are limited by health problems.

In addition, there are also some negative practical implications to consider, such as classroom and home privacy (Wadley et al., 2014), data protection (Pusztahly & Stefán, 2022), the possibility of technology malfunctioning or connection disruptions, and the high cost associated with implementing and maintaining telepresence bots (Khaksar et al., 2020). Some of the utilities through practical examples of the use of social bots and ICT in the classroom for other purposes are as follows, although the use of these technologies continues to grow in higher education:

1. Pedagogical robots: pedagogical robots, such as the NAO robot, are used to enhance learning in the classroom (Robaczewski et al., 2021). The literature shows the use of up to 26 types of robots (Dawe et al., 2019).
2. Virtual and augmented reality: Virtual and augmented reality is used to enhance the learning experience in the classroom (Boyles, 2017).
3. Educational games: Educational games are an effective way to enhance learning in the classroom (Amanatiadis et al., 2017).

In the case of students with a limiting illness with frequent hospitalisations or absences, this technology improves collaboration between school and home and allows the student to learn independently while maintaining social relationships (Zhu & Van Winkel, 2015). In this sense, the potential of social robots for bereavement support arises in the event of the death of a partner with a limiting or complex illness. Although there is no literature on the subject, it is estimated that they allow the class to say a gradual and preventive farewell to the sick classmate, which will result in a better emotional management of grief. It should be noted that this is a first approach to the subject in the form of an analysis of possibilities, without claiming to be a systematic review of the literature.

In summary, social robots can have both positive and negative implications for university learning. However, the implications for accessibility and inclusion of health-limited students and bereavement management for their peers, while improving the efficiency and quality of education in general, need to be analysed.

3. Critical argument and conclusion

The use of social robotics and ICT in higher education appears to have the potential to improve the quality of teaching and support for students with limiting illnesses. However, it is important to keep in mind that social robotics and ICT are complementary tools and not a single, definitive solution to all the challenges that students with limiting illnesses may face.

One criticism of social robotics in the educational context is that, while it can provide a physical presence for students with limiting illnesses, it cannot replace human interaction and the face-to-face teaching experience. Social robotics and ICT can improve accessibility and participation, but cannot provide the same experience as a face-to-face classroom and interaction with peers and the teacher. In addition, it is important to consider equity and accessibility in the use of social robotics and ICT in education. Not all students have access to the same technological resources and, in some cases, social robotics and ICT may exacerbate inequalities rather than reduce them.

There is as yet no evidence of their usefulness and effectiveness in emotionally managing the grief of peers who are left behind, although it is thought that they may be a useful resource for dealing with empty chair syndrome in the classroom. The figure of the robot in the classroom allows for a remembrance of the departed peer, while the teacher guides a gradual farewell to the departed peer. Finally, it is important to highlight the need for proper and ethical regulation in the use of social robotics and ICT in education. There is a need to ensure the privacy and security of student data, as well as to consider the possible social and ethical implications of the use of social robots in the classroom.

In conclusion, although social robotics and ICT can be valuable tools to support students with limiting conditions in higher education, it is important to carefully evaluate the uses, advantages and disadvantages before implementing them. A balanced and critical approach is required to ensure that these technologies are used ethically and effectively to enhance education and, above all, further research is needed on the potential of using this technology beyond distance learning.

Based on the above, the following recommendations are made for future research on the use of social robotics and ICT in higher education:

1. Detailed evaluation of the effectiveness of social robotics and ICT in improving the quality of teaching and support for students with a limiting illness.
2. Comparative studies between the experience of students with illness in a face-to-face classroom and a virtual classroom using social robotics and ICT.
3. Research on equity and accessibility in the use of social robotics and ICT in education, including analysis of barriers to accessing the technology and the possible exacerbation of inequalities.
4. Studies on ethical regulation in the use of social robotics and ICT in education, including privacy and security of student data, as well as the social and ethical impacts of their use in the classroom.
5. Cost-benefit analysis of the implementation of social robotics and ICT in education, including teacher training and the infrastructure required for its use.
6. Studies on the training needs of teaching teams so that they can make appropriate use of these technologies in the Teaching-Learning processes.
7. Analysis of the pedagogical, organisational and technological needs of educational centres to adequately integrate social robotics in the classroom.

These recommendations can help future research to gain a more complete and critical understanding of the use of social robotics and ICT in higher education and to make informed decisions about their implementation. What is undeniable is that technology is the future of education, so it is our responsibility to adapt and adapt this technology in the service of educational quality.

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