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University of Pavia 19 - 21 June 2024

Lifelong Digital Learning and Education:
promoting flexibility, inclusion, critical thinking and
international exchange

Annamaria DE SANTIS, Elena CALDIROLA e Pietro CARRETTA

Conference PROCEEDINGS



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DIGITAL EDUCATION
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Preface

ISYDE 2024, the *Italian SYmposium on Digital Education*, has been jointly organized by the *Italian e-Learning Society* (Sle-L, <https://www.sie-l.it/>) and *Italian Society for Media Education Research* (SIREM, <https://sirem.org/>).

The 2024 edition focused on “Lifelong Digital Learning and Education: promoting flexibility, inclusion, critical thinking and international exchange” and aimed to promote innovative teaching and learning experiences enabled by technologies in the national and international scenario, able to transform educational paths into flexible and inclusive ecosystems.

Good teaching practices are the starting point for removing barriers and promoting inclusion, intercultural, and international exchange; favoring wellbeing and professional upskilling and reskilling throughout life through education and appropriate communication strategies; critically analyzing digital messages and environments.

The conference, which serves as a meeting point for sharing research, experiences, and technological applications, was held at the University of Pavia (Italy) from June 19 to 21, 2024.

Nearly 200 participants presented more than 60 contributions merged into eight Sections in the proceedings:

- Blended and Distance Learning (8)
- Teaching innovations, Communicating Science and emerging technologies in Education (10)
- Digital UpSkill and ReSkill for Adult Learners, Career Development and Training (5)
- Experiences in Education (11)
- Digital Citizenship and Media Literacy (4)
- Diversity, Equity, and Inclusion (6)
- AI in Education (13)
- Collaboration Projects and Networks (5).

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Social robotics in hospitals and the professional learning needs of professionals. An empirical research design

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Abstract

The ethics of social robotics is currently part of a broader debate related to emerging and pervasive intelligent technologies. The aim of this contribution is to explore the specific context of social robotics in hospital settings. Specifically, our study focuses on the professional learning needs of professionals involved in these delicate, technology-mediated socio-relational interventions. The authors' prior research laid the groundwork for the present multiple case study design, which employs a qualitative ethnographic methodology, instantiated through fieldwork, to explore the professional dynamics involved in experiences of social robotics in hospitals. The primary aim, within the action-research perspective inherent to the case study, is to gain an in-depth understanding of the following dimensions: (a) identification of professionals involved in social robotics interventions; (b) the potentialities and ethical concerns (especially in terms of quality care) that professionals hold towards the use of social robotics in hospitals; (c) the existence of specific training paths and the training needs of professionals; (d) the significance of the educator as a professional involved in social robotics interventions in hospitals.

Keywords: Social Robotics, Education, Professional Learning, Hospital, Research Design.

1. Introduction

The research project aims to explore the emerging and expanding technology of social robotics within the sensitive context of hospital care, from primarily ethical, pedagogical, and educational perspectives. Specifically, the teleological focus is centered on the in-depth analysis of the professional roles involved in these delicate technological-relational interventions, identifying the training needs associated with the ethics of good care (Mortari, 2015; Coeckelbergh, 2022) and professional agency (Bandura, 2006; Biesta & Tedder, 2016; Kerr, Barry & Kelleher, 2020; Raffaghelli, 2022) capable of responding ethically, equitably, and consciously to the relational challenges introduced by human-technology interaction (Raffaghelli, 2022; Khun & Raffaghelli, 2023).

The narrative and systematic literature reviews conducted by the authors have highlighted a growing interest in the uses (and misuses) of social robotics, also from an ethical standpoint (Coeckelbergh, 2022; Tamburrini, 2020; Doumochel & Damiano, 2019). For example, Sharkey & Sharkey (2012) focus on ethical discussions related to vulnerable individuals (such as young children and the elderly), highlighting several thematic issues that intersect with risks and respect for fundamental human rights: (1) the potential reduction in the amount of human contact; (2) an increase in feelings of objectification and loss of control; (3) a loss of privacy; (4) a loss of personal liberty; (5) deception and infantilization; (6) the circumstances under which elderly individuals should be allowed to control robots. Other research emphasizes ethical considerations for the responsible use of AI (currently inextricably linked to social robotics). A guiding example for the authors' research lines is the contribution by Floridi et al. (2018), which outlines the principles of beneficence, non-maleficence, justice, autonomy, and explicability (Floridi et al., 2018).

To avoid the risk of ethical discussions remaining confined to an abstract level (Kerr et al., 2020), this contribution acknowledges the urgency of focusing on professionals who concretely operate

with social robotics in hospital settings. Literature reviews have indeed identified a unified research gap concerning the professionals engaged in such interventions and, more importantly, the existence of specific training paths.

In the systematic review process, only one article centered on the training needs of professionals emerged: the international work by Papadopoulos et al. (2023), which lists a series of needs identified by professionals, primarily focusing on technical requirements for the functional use of social robots. There is no broad reflection in ethical, educational, or agentive terms, raising two risks: downplaying the inherent complexity of the predominantly relational nature of social robotics; relegating the concept of training to a purely technical “training,” without opening up to broader horizons of professional learning.

The constitutive characteristic of relationality, moreover, highlights another gap in the examined literature: although the interdisciplinary nature of social robotics is emphasized (Rossi, 2019; Becchimanzi, 2022), specific references to the contribution of predominantly pedagogical-educational figures are almost absent. This gap is particularly important to highlight, especially in the hospital context where social robotics is an expanding technology, mainly used with vulnerable pediatric and elderly patients. It is also an area where the concept of care transcends therapeutic boundaries, entering the space of good care, where the educational relationship plays a central role.

In line with the ethical principle that technology is not inherently neutral but fundamentally depends on the quality of the socio-cultural context in which it is embedded (Cingolani & Magnani 2018; Cingolani 2019; Coeckelbergh, 2022), there is a recognized need to build environments of trust, with clear agentive responsibilities aligned with reliable human values (Floridi et al., 2018; Dumouchel & Damiano, 2019; Rossi, 2019).

It is believed that a fundamental step in this direction is to emphasize attention and care towards the dimension of professionalism, which plays a primary role in the governance and operationalization of social robotics interventions and consequently has an undeniable impact on their outcomes.

This perspective implies recognizing that ethics must necessarily be linked to the educational dimension, within the space of relationship and good care: an inextricable, circular, and systemic triangulation that, once again, calls for the need to “care for those who care,” advancing research lines that involve professional agency, education, and training in terms of professional learning.

Based on this scenario, four main areas of investigation for the project are identified, guiding and establishing the framework for the empirical phase: (a) identification of the professionals involved in social robotics interventions in hospitals; (b) ethical potentials and concerns that professionals have regarding the use of social robotics in hospitals; (c) the existence of specific training paths and the training needs of professionals; (d) the significance of the educational role as a professional category involved in social robotics interventions in hospitals.

The general aim of the research design, therefore, is to promote a formative and reflective culture regarding the use of social robotics in the hospital context, with particular attention to the ethical implications of good care and the challenges of educational agency for the professionals involved.

The specific objectives converge on:

- Identifying existing training lines and the configuration of professional teams involved in social robotics interventions in hospitals;
- Identifying the training needs, highlighting the critical-reflective and practical implications for professionals in the use of social robotics in hospitals;
- Understanding the relevance of educational professionalism in the hospital context that uses social robotics;
- Raising awareness within the scientific community about the importance of ethical care and professional agency in relation to technology, contributing to the development of innovative training tools.

2. Materials and Methods

In line with the exploratory and comprehensive objectives that guide the research project, the methodological approach is qualitative in nature. The accuracy of the information that qualitative research allows one to acquire within a specific context, and the flexibility of data construction procedures that “enable participants to express themselves in their own words and act in their natural life contexts” (Cardano & Gariglio, 2024, p. 35), represent the foundational strengths underlying the authors’ choice. The ability to explore personal narratives and interpret the meanings attributed by social actors to their lived experiences makes the qualitative approach particularly effective for investigating emerging or underexplored phenomena (Merriam & Tisdell, 2015), “combining rigor with creativity” (Cardano & Gariglio, 2024, p. 37).

Specifically, the methodology employed is the multiple-case study (Yin, 2017; Creswell & Poth, 2017; Günes & Bahçivan, 2016). This approach enables an in-depth understanding of a complex phenomenon through the analysis of multiple cases that may present significant variations, convergences, or differing conditions: “a multiple-case study includes two or more cases or replications across the cases to investigate the same phenomena” (Lewis-Beck, Bryman & Liao, 2003; Yin, 2017).

The involvement phase of the case studies did not follow a completely linear path, primarily due to the limited dissemination of social robotics as an emerging technology, which is often confined to experimental and non-continuous projects. Additionally, access to hospital environments, characterized by high complexity, regulation, and sensitivity, represents a significant challenge for conducting research.

In particular, one of the initially involved cases underwent a change during the process due to unforeseen timing issues, which indefinitely postponed the start of the social robotics project. However, addressing unforeseen events and continuously adapting the research design is an integral part of the qualitative research process (Becker, 1998; Coffey, 1999), in line with the flexibility of the approach. From this perspective, the authors’ reconsideration has led to recognizing the value of expanding the study’s perspective by initiating collaboration with an international hospital setting.

Given these premises, the research design includes the involvement of three case studies:

- *University of Padua (Department of Women’s and Children’s Health)*, under the direction of Prof. Franca Benini, which envisages the use of social robotics in pediatric care (Pediatric Hospice Unit). Specifically, the Hospice utilizes the social robot OHMNI Robot (Figure 1).
- *University of Modena and Reggio Emilia*. At the Modena Polyclinic (PASCIA Center), the team coordinated by Prof. Maria Grazia Modena uses the social robot NAO (Figure 2) with pediatric patients within the autism spectrum.
- *Hôpital de jour du Centre André Bouloche, Paris*. Director Marie-Noëlle Clément, with the team coordinated by Dr. Olivier Duris, uses the NAO robot (Figure 2) with pediatric patients within the autism spectrum.

Figures 1 and 2 below illustrate the aesthetics of the social robots considered in the study. OHMNI Robot (Figure 1) is a telepresence robot developed by OhmniLabs, designed to facilitate remote communication in various settings, including healthcare. OHMNI Robot stands out for its ease of use and high-definition video and audio capabilities, allowing for smooth and natural interactions from any location. It is equipped with advanced technologies such as a high-definition camera, noise-canceling microphone, and an autonomous navigation system that avoids obstacles, enabling users to move safely even in complex environments like hospitals. Aesthetically, it consists of a kind of stem topped with a screen and camera, on which the professional appears in telepresence (<https://ohmnilabs.com/>). The NAO robot (Figure 2), developed by SoftBank Robotics and originally created by Aldebaran Robotics, has humanoid features. It is equipped with joints that allow various movements, including the ability to walk, dance, and gesture. It has numerous sensors that enable it to interact with the surrounding environment and people. NAO is programmable through various platforms and can thus be adapted to projects ranging from artificial intelligence to human-robot interaction (<https://us.softbankrobotics.com/nao>).



Figure 1 (left) – OHMNI Robot (source: telepresencerobots.com).

Figure 2 (right) – NAO Robot (source: NAO | Robot Wiki | Fandom).

Regarding the empirical phases of the multiple-case study, the authors have outlined four key stages for each case involved, as summarized in Table 1. For each research phase, the objectives, data collection tools, timeline, and data analysis approach are highlighted.

Based on Table 1, which provides a summary of the empirical phases of the research design, the authors highlight a methodological note regarding the use of a speculative scenario as a prompt for initiating the focus group. The purpose of utilizing a speculative scenario establishes a bridge of continuity and alignment with the methodological reflexivity lines that have characterized the research project since its inception (Valentini & Raffaghelli, 2023). Referring to Jen Ross's speculative method (2016) and Futures Studies, we acknowledge that 'working with the future' (Poli, 2019) can open up an innovative and creative theoretical-operational approach to address complex topics collaboratively.

Citing Ruha Benjamin (2016), Costello et al. (2024) emphasize certain statements recognizing the methodological and educational value of the futures approach: "the facts, alone, will not save us [...]. Social change requires novel fictions that reimagine and rework all that is taken for granted about the current structure of society. Such narratives are not meant to convince others of what is, but to expand our own visions of what is possible" (Benjamin, 2016)" (Costello et al., 2024, p. 1).

Moreover, as Poli (2019) points out, working with the future represents a highly collaborative activity, wherein a powerful mutual enrichment occurs in the co-construction not only of a novel narrative to aspire to but also of concrete actions to be translated and implemented in the present (Poli, 2019). This approach deeply reconnects with the essence of educational planning, restoring ethics to the here and now as a space for choices, in light of the transformative value of the 'not-yet' (Ross, 2017).

3. Results

Currently, the research is focused on developing the four empirical phases at the Modena and Padua sites, with the collection of raw data. At the Modena University Hospital, two semi-structured interviews were conducted: the first with Prof. Modena, as the key professional figure in organizing social robotics interventions, and the second with the engineer responsible for programming NAO. The complexity of the hospital organization allowed for a focus group with three professionals: a doctor, a resident, and an administrative technician from Unimore with a significant role in organizing and training related to NAO.

Table 1 - Empirical Phases of the Research Design.

<i>Research phases</i>	<i>Objectives</i>	<i>Data Collection Tools</i>	<i>Expected Duration</i>	<i>Data Analysis Approach</i>
Non-Participant Direct Observation	Observe professional dynamics during a social robotics intervention	a) Paper-pencil recording b) Autoethnography diary c) Photos/videos	Duration of observation depends on hospital service organization	Thematic qualitative analysis of collected data
Semi-Structured Interview	a) Identify and interview the key figure overseeing social robotics interventions in the hospital services b) Highlight the overview of social robotics use in motivational and organizational terms c) Identify the presence of training paths for professionals involved in interventions d) Assess the perceived training needs of the key figure e) Understand the presence and role of educational professionals in the team	a) Audio recording b) Autoethnography diary	Max 45'	Thematic qualitative analysis of collected data
Focus Group	a) Hear the voices of professionals involved in social robotics interventions in the hospital service b) Identify the training needs of professionals c) Initiate a critical reflective discussion on ethical (good care) potentials and concerns regarding social robotics use d) Understand the presence and role of educational professionals in the team e) Share interdisciplinary professional agency experiences f) Use a speculative scenario as a starting stimulus for discussion	a) Audio recording b) Autoethnography diary	Max 1h/1h.15'	Thematic qualitative analysis of collected data
Member checking	a) Public engagement Transparency c) Data validation through participant confirmation and research quality improvement	a) Audio recording b) Autoethnography diary c) Photos	1h	Thematic qualitative analysis of collected data

Regarding non-participant observation, it was possible to attend two social robotics interventions with pediatric patients, in the presence of the caregiver and three professionals. Similarly, at the Pediatric Hospice in Padua, two non-participant observations of social robotics interventions with pediatric patients were conducted, with the caregiver and the professional (psychologist) in telepresence via the OHMNI robot. The semi-structured interviews collected contributions from Prof. Franca Benini, the service director, the psychologist coordinating social robotics interventions, and the psychologist using the robot remotely to conduct psychological sessions with patients and parents. The focus group phase involved eight professionals: two doctors, an engineer, a psychologist, and four nurses.

Since the research is ongoing and the raw data are awaiting thematic analysis, the authors provide a preview of some preliminary observations without interpretation or conclusions. A primary consideration concerns the aspect of training: a general lack of training in terms of professional learning and good care emerged, and some professionals emphasized this as a

genuine professional need. A second observation concerns a general (but not absolute) lack of understanding of educational professionalism: participants often suggested that educational professional skills could be seen as transversal attitudes that might be fulfilled by other professions. Only in a few cases was the value of the pedagogical-educational contribution recognized within teams dealing with social robotics. A third preliminary insight from the focus group highlights a general appreciation for the speculative scenario proposed as an initial reflective stimulus. In terms of preliminary results, it is also noted that the autoethnographic diary (present throughout all research phases) has proven to be an effective tool for capturing nuances and dynamics from a personal and pedagogically oriented perspective.

“Autoethnography is a unique combination of a heterogeneous set of research approaches and writing forms that aim to systematically describe and analyze (‘graphy’) personal experiences (‘auto’) in order to understand the cultural experiences (‘ethno’) in which they are embedded” (Gariglio, 2017)” (Cardano & Gariglio, 2024). This “authoritative” tool (ibid.) has allowed for exploring the intersections between individual experience and cultural context with a distinctive level of depth and reflexivity. Through autoethnography, the researcher has taken on an active role in the interpretive process, giving voice to personal experiences and perceptions, which, expressed through their own lexical choices, become an integral part of the scientific narrative (Ellis, Adams & Bochner, 2011). In this way, the autoethnographic diary not only serves as a record of observations but also as a tool for critical analysis and introspection, enriching the overall research framework.

The research group’s expectations regarding the final results aim at understanding the professional dimension involved in the delivery of social robotics interventions in each hospital case involved. This anticipated understanding particularly seeks to:

- Highlight existing training pathways
- Identify the training needs of professionals
- Emphasize the critical-reflective implications of using social robotics for professionals from a perspective of good care
- Emphasize the practical implications of using social robotics for professionals from a perspective of good care
- Identify convergences and divergences among the case studies involved
- Understand the relevance of educational professionalism in the hospital context using social robotics
- Contribute to documenting the use of social robotics in hospitals from the perspective of professional dynamics
- Contribute to raising awareness within the scientific community about the importance of “caring for those who care” to promote authentically ethical and educational contexts in relation to technology
- Generate new reflections and perspectives on educational action (e.g., the development of innovative teaching and training tools).

4. Conclusions

This contribution has described the empirical phase of the research design, which represents the core of a doctoral project. Based on the narrative review and the systematic literature review, four main areas of investigation emerged, guiding the project’s development, including the related phases and data collection tools. The general and specific objectives, the methodological approach, the current progress, and the research group’s open perspectives regarding the final results were highlighted. In conclusion, three cross-cutting considerations reflect the purpose and value of this work.

First, the complexity of today’s digitalized *onlife* society and the relationship between humans and technology requires a new mindset: “complex situations are characterized by the lack of ‘right’ answers.

References to the past are no longer sufficient. New innovative patterns emerge” (Poli, 2019, p. 64). This calls for an urgent appeal to planning, reflexivity, creativity, knowledge, and skills inherent to pedagogical-educational professionalism, which is called upon to take a stand and embrace the challenge posed by this ever-evolving relational complexity.

Lastly, this commitment must be embedded in the space of good care, that is, care that is both ethical and educational (Mortari, 2015). This space is necessary to promote the creation of authentic educational contexts, starting from the agentive training of those on the front line working with new technologies.

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We see in these open collaborations a valuable opportunity to build a shared and synergistic sense of purpose, one that respects the inherent complexity and is aimed at fostering good care and the overall well-being of the individual.

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