Module 2 - TRN CULTURAL KNOWLEDGE, Learning Unit 2.3. Benefits and Challenges

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THEORETICAL COMPONENT

Principles and Values

Healthcare settings worldwide are under tremendous strain from the rapidly growing demand associated with the aging population and chronic conditions like dementia. The public expects healthcare organisations to keep pace with the changing societal needs and serve the elderly population with compassion and quality of care. Given the complexity of providing quality care, adopting and integrating technology into practice could be seen as an important opportunity, but it can also be perceived as a significant challenge. Social robots can help address some of the challenges in healthcare settings, such as the shortage of elderly care staff. However, the design of these social robots should reflect human values and principles and enhance the well-being of consumers.

The principles and values that guide this tool include:

- Interpersonal communication (verbal and nonverbal)
- Quality of life
- Human dignity
- Helping
- Caring
- Empathy

Aims

The aim of this learning unit is to develop your understanding and awareness of Social Assistive Robots (SAR) benefits and challenges in the context of health and social care

Learning outcomes

At the end of this training, the participants will be able to:

- Explain the potential benefits of using SARs in health and social care concerning formal care staff.
- Discuss the potential challenges that health and social care staff may face when using SARs in health and social care.

Relevant definitions and terms

Cultural Knowledge. It derives from a number of disciplines such as anthropology, sociology, psychology, biology, nursing, medicine, and the arts, and can be gained in a number of ways. Meaningful contact with people from different ethnic groups can enhance knowledge around their health beliefs and behaviours as well as raise understanding around the problems they face (Papadopoulos, 2006).

Cultural Robotic Knowledge. Culturally knowledgeable socially assistive robots combine concepts, principles, values, theories, practices, behaviours, and properties from a number of disciplines such as computer sciences, robotic engineering, anthropology, sociology, psychology, caring sciences, and

cultural studies, to enable robots to perform task and communicate with humans in culturally appropriate ways (Papadopoulos I & Sgorbissa A.).

Socially assistive robot (SAR). The combination of Assistive Robots and Social Robots is called a Socially Assistive Robot (SAR). SAR is a type of robot whose primary goal is to create close and effective interaction with a human user for the purpose of providing company, fostering independent living, giving assistance, and achieving measurable progress in convalescence, rehabilitation, learning, etc. alongside or instead of physical aid (Winkle et al., 2020).

SARs share with Assistive Robots the goal to provide assistance to human users but put the emphasis on assistance through social interaction.

SARs are complex types of robots since they need to mimic human behaviour as much as possible to create the image of a personality and human-like interaction. These two objectives allow the platform to generate empathy with the users and develop more efficient communication with them. Also, by adequately reacting not only to the person but the environment as well, the robot may be capable of performing multiple tasks.

What the research says

- **Wu Y, Wrobel J, Cornuet M, Kerhervé H, Damnée S, Rigaud A. Acceptance of an assistive robot in older adults: a mixed-method study of human–robot interaction over a 1-month period in the Living Lab setting. Clin Interv Aging. 2014;9:801-811.** Since people live longer and older people constitute an increasing proportion of the population, there is progressively insufficient availability of specialized caregivers. Therefore, one possible form of support that has the potential to solve the problems of the aging of European societies, at least partially, is the use of assistive robots in the care of older people. Such robots can make it easier for older people to remain independent for longer while also reducing the burden on the family and formal caregivers. The article concludes that robots can not only help older adults in everyday life, but also be used in medical care (eg, for remote monitoring of patient health), which can additionally contribute to reducing costs for public services or care-assurance budgets. Available here.
- **Lukasik S, Tobis S, Wieczorowska-Tobis K, Suwalska A. Could Robots Help Older People with Age-Related Nutritional Problems? Opinions of Potential Users. International Journal of Environmental Research and Public Health. 2018; 15(11):2535.** Several models of robots supporting older people, with quite a variety of uses, have been developed. Robots can be used as aids in preparing and consuming meals, daily toileting, doing housework, and monitoring the user's state of health, among others. In addition, these devices can also provide company to older users (e.g., as chess companions) and encourage them to do cognitive training, as some studies have suggested the positive effects of these devices on cognitive function in older people. Social robot interventions have been reported to improve mood and reduce stress levels in elderly users. Available here.
- **Łukasik S, Tobis S, Kropińska S, Suwalska A. *Role of Assistive Robots in the Care of Older People: Survey Study Among Medical and Nursing Students.* J Med Internet Res 2020;22(8):e18003.** Assistive robots can help older people remain independent for longer and support and facilitate the work of health workers and formal caregivers. This research concentrated on the approach of future health care professionals to the use of robots in the care of older people, and what roles they think such devices should play. In general, the results of the analyses indicate a positive attitude of medical and nursing students to socially assistive robots. The vast majority of participants saw high potential in such devices. However, participants in the study suggested that older people might not yet be ready to use such devices owing to difficulties in handling these devices. In addition, the problem may concern not only the operation of the robots but also the selection of the most suitable model or the setting of functions appropriate for a given user. According to the students who participate in this study, older people often do not have sufficient knowledge of electronic devices or their suitability for potential users' needs and requirements.

Therefore, the study participants pointed to the necessity to provide specific training to older people on the use of robots. Furthermore, the study revealed that the most important roles of assistive robots relate to functions such as reminding people about taking medications, ensuring the safety of older people, preventing deterioration of their memory, and encouraging them to maintain physical activity. Future doctors and nurses were most critical of using a robot as a companion of an older person. Available here.

- **Heerink, M., Kröse, B., Evers, V. *et al. Assessing Acceptance of Assistive Social Agent Technology by Older Adults: the Almere Model. Int J of Soc Robotics* 2, 361–375 (2010).** This paper proposes a technology acceptance model that is specifically developed to test the acceptance of assistive social agents by elderly users. The research in this paper develops and tests an adaptation and theoretical extension of the Unified Theory of Acceptance and Use of Technology (UTAUT), by explaining intent to use not only in terms of variables related to functional evaluation like perceived usefulness and perceived ease of use, but also variables that relate to social interaction. The new model was tested using controlled experiments and longitudinal data collected regarding three different social agents at elderly care facilities and older adults' homes. The model was strongly supported by experiments, accounting for 59–79% of the variance in usage intentions and 49–59% of the variance in actual use. Available here.
- **Hung, L., Liu, C., Woldum, E. *et al.* The benefits of and barriers to using a social robot PARO in care settings: a scoping review. *BMC Geriatr* 19, 232 (2019).** Social robots may serve multiple functions: affective therapy, cognitive training, social facilitator, companionship, and physiological therapy. Specifically, the social robot - PARO (a baby harp seal robot) was designed as pet therapy for older people with dementia. PARO has been commercialized and used in care settings for more than a decade in multiple countries. This review aims to map out the empirical evidence on the key benefits of PARO and identify barriers that may impede the adoption of this social robot. The questions guiding this review are: What has been reported in the literature regarding the benefits of PARO in dementia care? What are the barriers to adopting PARO in the care setting? The study concludes that key benefits include reducing negative emotional and behavioral symptoms, improving social engagement, and promoting positive mood and quality of care experience. While the social robot PARO offers technological opportunities in supporting dementia care and managing difficult behavioral symptoms, the adoption of PARO in care settings remains low. Key barriers to the adoption of the technology include cost and workload, infection concerns, stigma, and ethical issues. Available here.
- **Shourmasti ES, Colomo-Palacios R, Holone H, Demi S. *User Experience in Social Robots. Sensors.* 2021; 21(15):5052.** This study aims to summarize the extant literature focused on user experience in social robots and identify the challenges and benefits of user experience evaluation in social robots. The authors carried out a systematic literature review that relies on PRISMA guidelines to achieve this goal. Findings revealed that questionnaires and interviews are the most common methods to evaluate user experience in social robots. User experience evaluations were found to be beneficial in providing early feedback and, consequently, handling errors at an early stage. However, despite the importance of user experience in social robots, robot developers often neglect to set user experience goals due to a lack of knowledge or time. This study emphasizes the need for robot developers to acquire the required theoretical and practical knowledge on how to perform a successful user experience evaluation. Available here.

What do national legislation and international/European treaties and conventions say on the topic?

In February 2017, the European Parliament adopted a Resolution on Civil Law Rules on Robotics with recommendations to the Commission. It proposed a whole range of legislative and non-legislative initiatives in robots and AI. In particular, it asked the Commission to submit a proposal for a legislative instrument providing civil law rules on the liability of robots and AI. (Available here)

Paragraphs 31 and 31 of the report refers to care robots as follows: "…underlines (the European Parliament) that elder care robot research and development has, in time, become more mainstream and cheaper, producing products with greater functionality and broader consumer acceptance; notes the wide range of applications of such technologies providing prevention, assistance, monitoring, stimulation, and companionship to elderly people and people with disabilities as well as to people suffering from dementia, cognitive disorders, or memory loss."

" Points out that human contact is one of the fundamental aspects of human care; believes that replacing the human factor with robots could dehumanise caring practices, on the other hand, recognises that robots could perform automated care tasks and could facilitate the work of care assistants, while augmenting human care and making the rehabilitation process more targeted, thereby enabling medical staff and caregivers to devote more time to diagnosis and better planned treatment options; stresses that despite the potential of robotics to enhance the mobility and integration of people with disabilities and elderly people, humans will still be needed in caregiving and will continue to provide an important source of social interaction that is not fully replaceable."

PRACTICAL COMPONENT

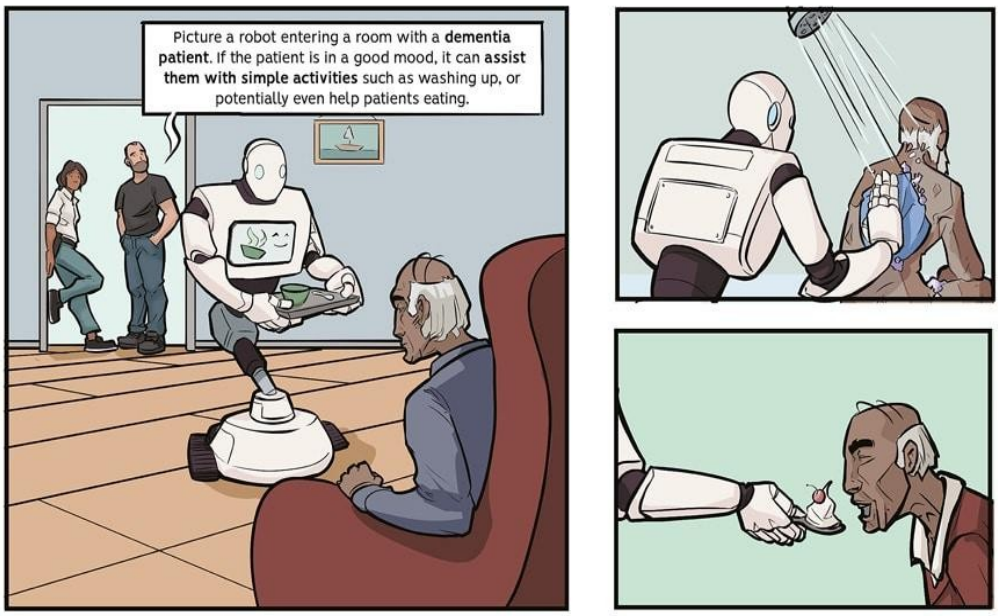
Learning Activities

Activity 1: Reading an article.

- Read the article The implementation of social robots during the COVID-19 pandemic.
- Write a post on the social platform for collaborative learning about how social robots can relieve healthcare providers under pressure during COVID-19 pandemic.
- Resources needed: online article; social platform for collaborative learning.
- Duration of activity: 30 minutes.

Activity 2: Social robots comic.

- Instructions: Korn, O (2020) and his Affective & Cognitive Institute research team are developing a comic. Underpinned by their research findings, it provides an innovative approach to inform the general public of future developments of social robotics in an entertaining way. Set within a detective story, various aspects of social robotics, ranging from real-life examples to the arguments of anti-robot activists, are presented in an engaging style. The comic is designed to appeal to audiences from school kids to university students and adults.
- Look at the picture below from Social Robot Comic Korn, O (2020).



- Describe three benefits and three challenges that you think would be most relevant in your work *OR* Design your Social Robot Comic (either with pen or pencil or using StoryboardThat).
- Share your answers or your comic with your group on the social platform for collaborative learning.
- Resources needed: Word or similar software for writing, paper and pen or pencil, StoryboardThat, social platform for collaborative learning.
- Duration of activity: 20 minutes.

ASSESSMENT COMPONENT

Assessment Activities

Activity 1: Quiz

- Go to the following address and answer the True and False Quiz.
- Post your results on the social platform for collaborative learning.
- Resources needed: GoConqr, a tool for online Questionnaires.
- Duration: 3 minutes.

EVALUATION COMPONENT

Participants to evaluation

The online evaluation questionnaire of each Learning unit is completed by the MOOC participants (students and student/facilitators) on Survey Monkey

What to evaluate

The Learning Unit's evaluation criteria are: coverage of the identified learning needs, innovation, quality of the content and training materials, intuitive and friendly presentation, relevance of learning activities, and efficiency for achieving established learning outputs.

Please, complete this online evaluation of the learning unit by clicking on this link:

https://www.surveymonkey.com/r/LJ5LVKZ