Module 2 TRN CULTURAL KNOWLEDGE, Learning Unit 2.4 Cultural aspects of socially assistive robots

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THEORETICAL COMPONENT

Principles and Values

Despite underpinning the whole field of Transcultural Nursing, and hence this whole project and curriculum, the principle of cultural competence informs this learning unit more strongly than others. As stated in another project output (IENE 10 IO 1.2), the TRN curriculum is designed to promote culturally competent and compassionate transcultural care using artificial intelligence and social robotics. Culturally competent and compassionate care (see definition below) is ethically founded upon the values of honesty, kindness, altruism, and co-operation (Papadopoulos, 2018). Within this paradigm, it is important to understand how users' different cultural backgrounds affect their acceptance of socially assistive robots and, consequently, the diffusion of robots. However, it is also compelling, on the other hand, to advance research and development to design autonomous social robots that can more and more align with this paradigm - by becoming culturally competent and in this way able to offer care of increasing quality.

The general principles and values for the IENE 10 are those associated with culturally competent and compassionate care (see definition below). More specifically, the values and principles of this learning unit are:

- kindness
- co-operation
- acceptance
- high quality
- acknowledging diversity
- valuing a person's cultural background/ identity

This learning unit is also founded upon the values and principles of transcultural robotic nursing, which include:

- open mindedness
- genuine curiosity
- innovation
- change

Aims

The chief aim of this learning unit is to raise awareness and understanding of the role of culture in the acceptance and use of socially assistive robots in health and social care. Another aim is to acquire basic insights into the research advancements towards designing culturally competent and compassionate socially assistive robots.

Learning outcomes

At the end of this training, the participants will have acquired a greater understanding and knowledge of:

- the cultural aspects that play a role when implementing socially assistive robots in health and social care;

- some positive and negative relations between the users' cultural backgrounds as well as demographics, and socially assistive robots' acceptance;
- the cultural influences in socially assistive robots' appearance;
- the role of culture on socially assistive robots' verbal and non-verbal communication style;
- Overview of culturally competent socially assistive robots.

Relevant definitions and terms

Culture. All human beings are cultural beings. Culture is the shared way of life of a group of people that includes beliefs, values, ideas, language, communication, norms, and visibly expressed forms such as customs, art, music, clothing, and etiquette. Culture influences individuals' lifestyles, personal identity, and their relationship with others both within and outside their culture. Cultures are dynamic and ever changing as individuals are influenced by, and influence their culture, by different degrees (Papadopoulos, 2006, p 10).

Individualism/Collectivism. In Geert Hofstede's study of national cultures, individualism is the dimension where social networks are lax and where individuals are expected to take care of only themselves and their immediate families. At the opposite end, collectivism refers to a preference for tightly-knit social networks where individuals, their relatives or members of a particular ingroup are very close and loyal to each other. Hofstede model of national cultures' comparison – along this, and other five dimensions (i.e., Masculinity/Femininity, Uncertainty Avoidance, Long/Short Term Orientation, Indulgence/Restraint, Power Distance) – is usefully applied to investigate the diffusion and acceptance of technology in relation to culture. (Hofstede Insights, 2021)

Culturally competent compassion. The human quality of understanding the suffering of others and wanting to do something about it using culturally appropriate and acceptable nursing interventions. This takes into consideration both the patients' and the carers' cultural backgrounds as well as the context in which care is given (Papadopoulos, 2011)

Culturally Competent Socially Assistive Robots. This term refers to AI-based, autonomous, often humanoid, socially assistive robots that are programmed with cultural knowledge in relation to specific cultures, so to be able to interact in a culturally sensitive way with users as well as acquire increasing information about users' culture as they interact with them. Culturally competent socially assistive robots are not currently in use yet.

Non-verbal Communication. The complex set of ways in which we communicate in forms different from our actual language. Non-verbal communication largely consists in our body language, such as postures, facial expressions, eye gaze, gestures, proxemics, haptics, appearance. Non-verbal communication can however also include paralinguistics (i.e., vocal communication separated from actual languages, such as voice volume, pitch, intonation etc.) and symbolic communications, with objects and images.

Proxemics. The study of personal space and physical distance between individuals in social interactions and situations. In human-robot interactions, the robot proxemics behaviour refers to its capacity to follow users' socio-cultural norms in establishing appropriate physical and psychological distancing. This capacity is central for the robot to better integrate into the human physical and social environment. Proxemics is a form of non-verbal communication.

Socially Assistive Humanoid Robot: Robots embodied as humans, programmed to interact with users through engaging in social interaction, with the involvement of gestures, speech, emotional expression, and other actions. Socially assistive humanoid robots are Socially Assistive Robots which in addition adopt the appearance of humans. Anthropomorphic robots and androids are robots with an enhanced, sometimes very realistic, human-likeness.

Zoomorphic Socially Assistive Robots. Referred to also as animal-/pet-like robots/robopets, these are Socially Assistive Robots embodied as animals, programmed to interact with users through engaging in social interaction, with the involvement of gestures, sounds, emotional expression, and other actions.

What the research says

- **Papadopoulos, I. (2018). *Culturally Competent Compassion*. Routledge.** A very useful and accessible book that brings together crucially important topics of cultural competence and compassion for the first time. The book defines "culturally competent compassion" as the ability to understand the suffering of others and wanting to do something about it using culturally appropriate and acceptable caring interventions. It also explores how to practise culturally competent compassion in healthcare settings. Available here.
- **CARESSES project website,** in particular the project research output. Below, a **selection of 3 articles** stemming from this project is provided:
    - **Papadopoulos, I. and Koulouglioti, C. (2018) The Influence of Culture on Attitudes Towards Humanoid and Animal-like Robots: An Integrative Review. *Journal of Nursing Scholarship*, Special Issue 2018 Nov;50(6):653-665.** This integrative review shows that culture influences attitudes and preferences towards humanoid and animal-like robots, particularly in relation to non-verbal behaviours and communication styles, with people being more accepting of a robot that behaved more closely to their own culture. Available here.
    - **Papadopoulos, I., Koulouglioti, C., Lazzarino, R. and Ali, S. (2019) Enablers and barriers to the implementation of socially assistive humanoid robots in health and social care: a systematic review. *BMJ Open*, 10(1).** This systematic review article concludes that available evidence related to implementation factors of socially assistive humanoid robots for older adults is limited but promising, mainly focusing on aspects at the individual level and exploring the acceptance of this technology. Investigation of elements linked to the environment, organisation, societal and cultural milieu, policy, and legal framework is necessary. Available here.
    - **Bruno, B., Recchiuto, C., Papadopoulos, I., Saffiotti, A., Koulouglioti, C., Menicatti, R., F. Mastrogiovanni, F., Zaccaria, R., Sgorbissa A. (2019) Knowledge Representation for Culturally Competent Personal Robots – Requirement, design principles, implementation, and assessment, *International Journal of Social Robotics*, 11(3), pp. 515-538.** Culture, intended as the set of beliefs, values, ideas, language, norms, and customs which compose a person's life, is an essential element to know by any robot for personal assistance. Culture, intended as that person's background, can be an invaluable source of information to drive and speed up the process of discovering and adapting to the person's habits, preferences, and needs. This article discusses the requirements posed by cultural competence on the knowledge management system of a robot. Available here.
- **Lim, V., Rooksby, M. and Cross, E.S. (2021) Social Robots on a Global Stage: Establishing a Role for Culture During Human–Robot Interaction, *International Journal of Social Robotics*, 13, pp. 1307–1333.** Robotic agents designed to assist people across a variety of social and service settings are becoming increasingly prevalent across the world. Authors synthesise two decades of empirical evidence from human-robot interaction (HRI) research to focus on cultural influences on expectations towards and responses to social robots, as well as the utility of robots displaying culturally specific social cues for improving human engagement. Findings suggest complex and intricate relationships between culture and human cognition in the context of HRI. The studies reviewed transcend the often-studied and prototypical east-west dichotomy of cultures and explore how people's perceptions of robots are informed by their national culture as well as their experiences with robots. Many of the findings presented in this review raise intriguing questions concerning future directions for robotics designers and cultural psychologists in conceptualising and delivering culturally sensitive robots. Authors highlight the critical role of culture in mediating efforts to develop robots aligned with human users' cultural backgrounds and argue for further research into the role of culturally-informed robotic development in facilitating human-robot interaction. Available here.

- **He, M. and Lee, J. (2020) Social culture and innovation diffusion: a theoretically founded agent-based model, *Journal of evolutionary economics* 30 (1109-1149).** Social culture (i.e., individualism, power distance, and uncertainty avoidance from Hofstede's cultural dimension theory) directly affects the small-world network structure and individual characteristics. The authors explore how the characteristics of innovation influence the diffusion process. Authors find that individualism positively affects the diffusion speed in the early stage, whereas uncertainty avoidance and power distance have negative effects on innovation diffusion. The characteristics of innovation affect its diffusion when the uncertainty avoidance is high. However, when both uncertainty avoidance and individualism are low, the effect of innovation on diffusion is restricted. Available here.
- **Samuel, S. (2020) Robot priests can bless you, advise you, and even perform your funeral. AI religion is upon us. Welcome to the future, VoX.** Magazine article, with several videos linked to it, which covers the innovative use of robots in the role of religious leaders. Available here.

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

- **Pasikowska-Schnass, M. (2020). Digital culture – Access issues. Briefing, EPRS - European Parliamentary Research Service.** The article discusses how digital shift has touched all aspects of human activity, and culture is no exception. Cultural assets and works have been digitised and digital technology has become a tool for novel creations. Digital born works have enriched the resources available to those interested in culture. Technology has huge potential to facilitate and democratise access to cultural resources. However, certain technical conditions are required to allow access to these cultural resources, for example webpages devoted to digitised cultural heritage and its hidden treasures as well as those devoted to novel creations. These conditions include an internet infrastructure, computers, tablets, or, more frequently, a smartphone – all of which has a price tag. Moreover, the deployment of such infrastructure needs to be evenly distributed so as to provide equal and democratic access to cultural resources – which is not yet the case. Available here.
- **Kulesz, O. (2016). The impact of digital technologies on the diversity of cultural expressions in Spain and Hispanic America, UNESCO.** The article arges that, in the past two decades, digital technologies have transformed the cultural scene profoundly. New forms of creation, production, distribution, access, and participation have revolutionized entire industries, such as book publishing, music, and film. Changes have brought both opportunities and challenges to the creative chain, in a process that has affected both the Global North and South. As the author aims to show, digital technologies have a significant impact on the landscape of opportunities, barriers, and policies associated with the protection and promotion of the diversity of cultural expressions in the digital era is highly complex. Following examination, new technologies cannot be said to be either positive or negative in themselves, the author maintain, but instead can be regarded as both an advantage and a challenge, depending on how they are applied in each context. Public policies have a decisive influence in defining the outcome in either direction. Available here.
- **Care Quality Commission (2019). The State of health and social care in England 2018/19.** The report mentions potential inequalities and issues that need to be considered, such as users' language and culture. The potential benefits of technological innovation are also outlined in this report. Additionally, the report outlines concerns about ethics and data protection. These barriers have been highlighted by staff, e.g., including attitudes of some staff towards technology (e.g., scepticism), and perceived complexity of adopting new technologies (including concerns about existing infrastructure). Available here.
- **Future Advocacy and Welcome Trust (2018). Ethical, social and political challenges of artificial intelligence in health.** This report describes several use cases and settings and outlines several ethical, social, and political challenges associated with AI use. Key themes are consent, fairness, and rights. Available here.

PRACTICAL COMPONENT

Learning Activities

Activity 1: Turn that Socially Assistive Robot into a culturally competent one! – a human-robot interaction scenario.

- Participants are asked to read through a hypothetical scenario where the user's English cultural background, together with other factors related to their health, religious inclination, and age, is not considered when implementing socially assistive robots in care.
- Participants are then asked to identify problematic situations in the scenario and rewrite the scenario so that the users' cultural background is taken into account.
- Participants are finally encouraged to share their rewritten scenarios on the discussion board of the social platform for collaborative learning, reflect upon fellow participants' scenarios, and provide feedback to at least one other participant.
- In order to prepare for this activity, participants are invited to read the 'Aims, Relevant Definitions and Terms' and 'What the research says' sections (see above).
- Resources needed: Word or similar software for writing, social platform for collaborative learning.
- Duration of activity: 20 minutes.

Human-robot interaction scenario.

Jane, a clinical nurse practitioner, is taking care of Mrs Davis. Mrs Davis is a retired English teacher who normally lives on her own. She has one daughter. Mrs Davis has Type II diabetes, she is an active member of her local church, and she likes gardening. However, during the last couple of months, her daughter has realised that she is getting forgetful. The night before, Mrs Davis called her daughter frantically in the middle of the night asking whether or not she had missed her granddaughter's birthday. She couldn't remember what day it was and she was afraid. These episodes were getting more frequent. Jane suggested to Mrs Davis' daughter that her mother could benefit from a humanoid socially assistive robot that can provide 24/7 monitoring and support. The robot is brought to the house. It is programmed with a generic support package for assisting older adults. In the morning the robot offers Mrs Davis options for breakfast, like coffee and a muffin, whereas for lunch it suggests a pizza, and for dinner, on a Friday, a beef stew and a carrot cake for dessert. In the morning, the robot wakes up Mrs Davis at the time set, by standing very close to her bed and by playing electronic music tunes. Later on, Mrs Davis tells the robot that she is bored, and the robot suggests watching some sports, mentioning basketball and judo, or play some games, such as Sudoku and Go. In the evening, when Mrs Davis asks the robot to call her family, it places a call with Mrs Davis' cousin living in Madrid. The robot is not learning from Mrs Davis different requests and corrections, and it is not asking open questions, with the result that she grows more confused and frightened by the SAHR, which, furthermore, has a tiny head, small eyes, and huge arms and hands.

Activity 2: Design your own culturally competent socially assistive robot.

- Participants are asked to reflect on how the cultural background of patients/clients may influence their expectations towards socially assistive robots' appearance and communication style.
- Participants are asked to share their idea - which could be a drawing, a photograph, or 500 words text, with fellow participants in the discussion area of social platform for collaborative learning.
- Participants are invited to read the 'Aims, Relevant Definitions and Terms', and 'What the research says' sections (see above) to prepare for this activity.
- Resources needed: Word or similar software for writing, social platform for collaborative learning.
- Duration of activity: 15 minutes.

ASSESSMENT COMPONENT

Assessment Activities

Activity 1: True/False Quiz

- You are presented with 6 statements related to the topic of this learning unit. Tick the correct 'True or False' option.
- Resources needed: Word or similar software for writing, pen or pencil.
- Duration of activity: 3 minutes.

True/False Quiz

- Culturally competent care is widely and systematically employed throughout the health and social care sector in many countries
- To successfully deploy culturally competent socially assistive robots in care homes in Sweden, UK and Chile, it is enough that they are only programmed with Swedish, English, and Spanish language competences
- Socially assistive robots' users will be more inclined to accept and use a socially assistive robot that speaks their own language, talks about familiar topics, suggests tailored entertainment, and learns from daily interactions
- Younger people from individualistic cultures are more likely to welcome socially assistive robots to care for their parents
- Users from different cultural backgrounds would similarly accept a socially assistive robot that keeps at a distance of two metres and always expresses happiness in its tone of voice
- Research has found that culturally competent socially assistive robots can be useful as companions to older persons and can help reduce loneliness and depression

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/LQYT7VG