

## EDITORIAL

# THE ADVENT OF ANTHROPOMORPHIC INTELLIGENT MACHINES: A BOON TO NURSING OR ITS NEMESIS?

**Rozzano C. Locsin**

Faculty of Nursing, Chiang Mai University, Chiang Mai, Thailand  
Tokushima University Graduate School of Biomedical Sciences, Tokushima, Japan  
Christine E. Lynn College of Nursing, Florida Atlantic University, Boca Raton, FL, USA

### Article Info:

Received: 13 October 2020

Accepted: 13 October 2020

### DOI:

<https://doi.org/10.33546/bnj.1225>

### \*Corresponding author:

**Rozzano C. Locsin, RN, PhD, FAAN**

Tokushima University Graduate School of Biomedical Sciences,  
18-15 Kuramoto-Cho 3, Tokushima 770-8509, Tokushima, Japan

Email: [locsin@tokushima-u.ac.jp](mailto:locsin@tokushima-u.ac.jp)

© 2020 The Author(s). This is an **Open Access** article distributed under the terms of the [Creative Commons Attribution-NonCommercial 4.0 International License](https://creativecommons.org/licenses/by-nc/4.0/) which allows others to remix, tweak, and build upon the work non-commercially as long as the original work is properly cited. The new creations are not necessarily licensed under the identical terms.

ISSN: 2477-4073

## KEYWORDS

robotics; artificial intelligence; creativity; nursing; humans; job description; inventions

*The issue of whether there will be enough jobs in the future receives substantial attention, mainly because of the well-publicized experiences of manufacturing workers whose jobs have been displaced by the introduction of robotics. It also reflects a long-held societal anxiety that machines will replace us (Casey, 2019)*

## INTRODUCTION

Technologically-savvy individuals are needed to seamlessly merge professional qualities as skillful and astute decision-makers. With this expectation, healthcare institutions prefer workers who have excellent technical skills in addition to having transformative insights toward innovative practices and abilities to practice their profession with multiple functionalities, especially with burgeoning healthcare industry demands (Gupta, 2019). In the later part of the 20<sup>th</sup> century, an industrial revolutionary mandate swept through the human world, all dictated by the enchantment to technological innovations. In addition, there was a clamor for workers to be multitaskers approached through re-skilling and retraining programs for existing workers so that they would function more efficiently with varying tasks. In doing so, the ratio of production to the sufficiency of outcomes has been improved by the adequacy of existing worker placements.

Rather than insufficiency as a result of a pre-assigned work-focused limitation of specified jobs for each worker, multi-tasking and retraining have efficiently altered work processes with less or no new personnel. For example, at one point in the fast-food business industry, cashiers received orders and payments and prepared these orders to be served to customers. However, during downtimes with fewer customers, a modification of work detail happens; the cashier may pick-up housekeeping/janitorial work, clean tables, mop floors, etc. This

type of multi-tasking is not a new work practice today; instead, it has become the standard of work practice.

## AIM

The purpose of this article is to describe the influence of technological advancements such as anthropomorphic intelligent machines on nursing as a professional practice today and in the future.

## RETRAIN AND RETAIN CLINICAL AND NONCLINICAL WORKERS

Employment in healthcare institutions is not exempted from this shift in perspective. One thing is evident; nurses are now engaged in multiple tasks and have many expected nursing practice chores. As you may have observed in your last visit to hospitals or other healthcare institutions, at some point in the nurse's practice assignment, nurses function over and above their "job descriptions." What you will tend to see is nurses executing activities that are expectations from an all-encompassing statement detail in their work descriptions, i.e., including all other activities that are deemed essential and critical towards assuring quality healthcare.

Retrained and re-skilled to perform these tasks that other healthcare personnel are expected to perform, except, of course, those of physicians, nurses can perform efficiently and effectively, such as tasks of transporters - taking patients for imaging procedures, etc. Other times, nurses are also assigned to perform housekeeping routines, especially when an institutional job description of housekeeping and janitorial workers are limited to those that can only be performed when the room is safe for them to clean, such as free from contaminated tubes

and gadgets, and portable monitors. However, nurses ought to be freed up to address the many missed nursing needs that are well documented, such as teaching, comforting, assessing beyond the chief complaint, discharge planning, etc., rather than regularly assigned custodial tasks

One of the biggest apprehensions of healthcare administrators is the integration of automation in clinical operations while at the same time decreasing the demand for more personnel. However, as [Aoun \(2017\)](#) has declared in his book, “Robot Proof: Higher Education in the Age of Artificial Intelligence,” strategies are needed to motivate efficiency and workplace satisfaction, such as a movement to “keep learning” and engage in educational opportunities. Although such strategies were found to influence retention and satisfaction of employees, not only furthering and continuing educational opportunities should be considered, but also addressing “employee strengths” through the recognition of their creativity, entrepreneurship, and teamwork.

This, in turn, can “inspire collaboration” in particular situations, such as involving advanced technologies like robots, so that instead of denying or refusing to work with technological advancements to mitigate workload, health care workers can be informed of the benefits of robotic technologies. This kind of collaboration can enhance work productivity, and job security can be emphasized through the distinction of working with colleagues attuned to robotic technologies and the utility of assistive healthcare robots as adding value to their practice.

## UTILITY OF TECHNOLOGIES IN HEALTHCARE SITUATIONS

Intelligent technological machines or AI-enabled robots impact human living in multifarious ways, e.g., transcending human frailties ([Locsin et al., in press](#)), enhancing social transformation, and liberating persons from the drudgery of human labor. Regardless, advancing technologies continue to impact healthcare through machine learning and deep learning by facilitating the identification and treatments of diseases and imaging processes such as Computerized Tomography scans and radiological data. So, what does all this mean for the future of nursing practice? While technological advances are being used to improve diagnosis and treatment, technological advances like robots are not effectively utilized in caring practice, such as assistance with toileting, ambulation and general range of motion, feeding, social engagement, and health teachings, etc.

As reported by the Brookings Institute, the automation potential of three medical occupations within the next decade is critical, 8% for home health aides, 29% for registered nurses, and 54% for medical assistants ([Muro et al., 2019](#)).

## IMPLICATIONS FOR NURSING WORKFORCE

Nurses need to embrace automation rather than fear it. In an interview with *The Medical Futurist*, Richard Booth suggested that nurses need to embrace automation rather than fear it ([Workforce Partnership Staff, 2019](#)). [Betriana et al. \(2020\)](#) also claimed that it is best to view healthcare robots as significant partners rather than perceiving them as threats to nursing. Similarly, the Head of the Robotics Group at MIT, Julie Shah, agreed that robots could be effective partners-in-nursing

when they can comprehend patient information and, with vigilance, inform nurses about patient care needs ([Metz, 2018](#)).

In practice, employee training and cross-training on cardiopulmonary resuscitation, nasogastric tube insertion, and other clinical procedures can be achieved through augmented reality processes. The Royal College of Nursing has asserted that by 2020, every UK nurse should be an e-nurse ([Royal College of Nursing, 2018](#)).

One of the main objectives in generating transformative nursing practice with technologies in healthcare is to enable nurses to act decisively in “real-time” with all the data available as provided by intelligent technological machines ([Workforce Partnership Staff, 2019](#)). A newer version of meaningful preceptorship activities in practice settings will need to be entertained.

## DISASTER OR PROGRESS?

Decades ago, innovations to routine activities were relegated to simple tasks such as floor vacuums with gadgets that have dependable sensors. Because of these innovations replaced workers could simply educate and re-skill themselves or be provided opportunities to do so, thereby providing the capabilities to increase their work value and outcomes. However, frequently, their retraining and re-skilling to do more tasks are demanded because of the technologized chores that decrease human work demands. Contemporary technologies threaten to replace higher-level human decision-making involving complex analytic processes and judgment-based skill-sets. Computers are becoming faster, producing more precise outcomes, thereby creating legitimate concerns for human-based work. The reality of robotics replacing many service and manufacturing positions supports the popular concern regarding the kinds of jobs, if any, that human nurses will be left to do.

[Locsin and Ito \(2018\)](#) in their article, “Can humanoid nurse robots replace human nurses?” have clearly articulated this concern. With a conditioned response dependent on the ontology of current and future nursing driving the answer to this question, they claimed that if nursing will be defined and described as tasks to be completed, then the obvious answer is clearly a resounding yes. Tasks can be translated to programmable instructions, uploaded to drive machine operating systems, thereby allowing more precise activities from intelligent healthcare robots in the performance of these nursing tasks. When this scenario describes the work of nurses that is defined simply as completion of tasks, then humanoid nurse robots can replace human nurses.

This is an imperative situation without obvious answers, but whether intelligent anthropomorphic machines can cause disastrous changes in nursing practice or lead it towards a highly motivated illustrious disciplinary work that can respond to human demands for quality health care remains a revolutionary question. It is believed that technological advancements in nursing will only be meaningful if nurses and persons being nursed can seize the benefits of AI technology.

One promising development is the continuing appreciation and utilization of the benefits of theory-based nursing practice. The theory of “Nursing as Caring” ([Boykin et al., 2001](#)) has grounded many more middle-range and practice theories such as “Technological Competency as Caring in Nursing” ([Locsin, 2005, 2016](#)), “Transactive

Relationship Theory of Nursing” (TRETON) (Tanioka, 2017), “Model of Robot Transactive Relationships with Human Nurses as Intermediaries” (MIRTH) (Osaka, in press). Theories such as these provide processes of nursing practice that also incentivize human caring in a highly technological world.

#### Declaration of Conflicting Interest

There is no conflict of interest to declare.

#### Author Biography

**Rozzano C. Locsin, RN, PhD, FAAN** is Visiting Professor, Faculty of Nursing, Chiang Mai University, Chiang Mai, Thailand | Professor Emeritus, Tokushima University Graduate School of Biomedical Sciences, Tokushima, Japan | Professor Emeritus, Christine E. Lynn College of Nursing, Florida Atlantic University, Boca Raton, FL, USA. ORCID iD: <https://orcid.org/0000-0002-2952-6538>. Scopus iD: [7003940978](https://orcid.org/0000-0002-2952-6538).

#### References

- Aoun, J. E. (2017). *Robot-proof: Higher education in the age of artificial intelligence*. Cambridge, MA, USA: MIT Press.
- Betrian, F., Tanioka, T., Locsin, R., Malini, H., & Lenggogeni, D. P. (2020). Are Indonesian nurses ready for healthcare robots during the COVID-19 pandemic? *Belitung Nursing Journal*, 6(3), 63-66. <https://doi.org/10.33546/bnj.1114>
- Boykin, A., Schoenhofer, S. O., & Schoenhofer, S. O. B. (2001). *Nursing as caring: A model for transforming practice*. Sudbury, MA: Jones & Bartlett Publishers Inc.
- Casey, M. (2019). How automation could make some jobs better. Retrieved from <https://www.brookings.edu/blog/up-front/2019/11/21/how-automation-could-make-some-jobs-better/>
- Gupta, I. (2019). Retraining and re-skilling workers for the imminent age of automation. Retrieved from <http://www.businessworld.in/article/Retrain-and-Re-skilling-Workers-for-the-Imminent-Age-of-Automation/30-03-2019-168591/>
- Locsin, R. (2005). *Technological competency as caring in nursing*. Indianapolis, IN, USA: Sigma Theta Tau International Press.
- Locsin, R. (2016). *Technological competency as caring in nursing* (Rev. ed.). Dumaguete City, Philippines: Silliman University Press.
- Locsin, R., Pepito, J. A., Juntasoopepun, P., & Constantino, R. (in press). Transcending human frailties: Technological enhancements and transhumanist perspective in nursing and healthcare. *Nursing Inquiry*.
- Locsin, R. C., & Ito, H. (2018). Can humanoid nurse robots replace human nurses. *Journal of Nursing*, 5(1), 1-6. <http://dx.doi.org/10.7243/2056-9157-5-1>
- Metz, R. (2018). Want to robot-proof your job? Here are some tips from experts in the field. Retrieved from <https://www.technologyreview.com/2018/06/04/142554/want-to-robot-proof-your-job-here-are-some-tips-from-experts-in-the-field/>
- Muro, M., Maxim, R., & Whiton, J. (2019). *Automation and artificial intelligence: How machines are affecting people and places*. Retrieved from [https://www.brookings.edu/wp-content/uploads/2019/01/2019.01\\_BrookingsMetro\\_Automation-AI\\_Report\\_Muro-Maxim-Whiton-FINAL-version.pdf](https://www.brookings.edu/wp-content/uploads/2019/01/2019.01_BrookingsMetro_Automation-AI_Report_Muro-Maxim-Whiton-FINAL-version.pdf)
- Osaka, K. (in press). The model of the intermediary role of nurses in transactive engagements (MIRTH). *International Journal for Human Caring*.
- Royal College of Nursing. (2018). Every nurse an e-nurse: Digital capabilities for 21st century nursing. Retrieved from <https://www.rcn.org.uk/clinical-topics/ehealth/every-nurse-an-e-nurse>
- Tanioka, T. (2017). The development of the transactive relationship theory of nursing (TRETON): A nursing engagement model for persons and humanoid nursing robots. *International Journal of Nursing & Clinical Practices*, 2017(4), 223. <https://doi.org/10.15344/2394-4978/2017/223>
- Workforce Partnership Staff. (2019). AI & healthcare: How to prepare for the impact on your workforce. *Southern New Hampshire University*. Retrieved from <https://www.snhu.edu/about-us/newsroom/2019/05/ai-healthcare>

**Cite this article as:** Locsin, R. C. (2020). The advent of anthropomorphic intelligent machines: A boon to nursing or its nemesis? *Belitung Nursing Journal*, 6(5), 147-149. <https://doi.org/10.33546/bnj.1225>