

## REVIEW

# Philosophical and Contextual Issues in Nursing Theory Development Concerning Technological Competency as Caring in Nursing

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**Abstract :** Theory development in nursing has been contentious so that issues about theory as knowledge base and counterpart of practice, and theory as the foundation of nursing as a discipline of knowledge and practice profession have facilitated the seeming ambiguity hindering theoretical contributions integral to human health and well-being. Nursing science continues to generate discussions about its development particularly grounding its practice as a legitimate component of human health care. The aims of this paper are (a) to describe three contemporary issues regarding theory construction and development in nursing, and (b) to advance a theory of nursing that can reconcile these issues. Content analysis following a review of literature revealed ontological, epistemological, and contextual issues on nursing theory development and theory-based practice perspective. The middle-range theory of Technological Competency as Caring in Nursing is advanced as integral to pursuing the reconciliation of theory development and practice engagements within the Universal Technological Domain in nursing and the health sciences. *J. Med. Invest.* 66 : 8-11, February, 2019

**Keywords :** *theory development, interdisciplinary practice, technological competency, nursing theory*

## INTRODUCTION

Since the 1960s, theory development in Nursing have established nursing science to what it is today, paving the way to its academic and practice disciplinary status. Regardless, nursing continues to face issues about theory development. Today, nursing is considered “at the crossroads” due to its longstanding philosophical, conceptual/theoretical and empirical approaches. Nursing has been more appreciated from the empirical dimension rather than from a philosophical and conceptual/theoretical stance, steering the development of disciplinary nursing knowledge (1). There is a need to advance philosophical viewpoints (2) and upgrade the conceptual models and theories of “nursing science in an interdisciplinary and transdisciplinary world” (3).

The practice of nursing in the future is dependent on its focus. Two significant questions that Roy pointed out are : “What kind of knowledge must be created for effective practice in today’s world?”, moreover, “How will nurse [scholars] translate nursing knowledge to the changes in practice needed locally and globally?” (4). Exploration of answers to these questions furthers the study of the philosophical, theoretical and contextual issues concerning nursing theory development.

Contextual phenomena such as the burgeoning technological advancements in health care (5), aging population, healthcare workforce shortage (6) and effects of globalization including increase in refugees, violence, climate change, global warming, infectious diseases, and drug wars (4) influence the global healthcare practice today. A myriad ways are required to develop knowledge, and innovate solutions focused on human caring with technologies in the health sciences, (7) and design practical processes of nursing,

such as transactive engagements (6). Contemporary nursing must emphasize interdisciplinary and collaborative knowledge development to address current practice issues that inform the future.

This paper aims (a) to identify three contemporary issues about theory construction and development in nursing, and (b) to describe the Technological Competency as Caring in Nursing theory to provide the blueprint for building contextually relevant interdisciplinary knowledge, that integrate caring science and the health sciences in the practice process of nursing.

## METHODS

A literature review was conducted using the Google Scholar, CINAHL and Medline databases with the keywords, *issues, theory development, theory construction, and nursing*. The literature search was restricted to peer-reviewed published articles from 2013 to 2018 ensuring relevance and currency of information. A total of 819 articles were retrieved, and 792 articles were discarded because it did not qualify for review. Twenty seven (27) articles were read and screened for relevance, after which, eight articles were selected for inductive content analysis regarding issues on nursing theory development. NVivo 12 system was used to categorize and classify data. How contemporary and future nursing may be reconciled by the philosophical influences was discussed after content analysis and synthesis of the selected literature were done. The concepts and processes of Technological Competency as Caring in Nursing (TCCN) were described based on the discussion of the philosophical issues in the context of technological and interdisciplinary relevance.

## FINDINGS

The findings revealed that three current issues of theory development in nursing were categorized as philosophical/theoretical

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issues about nursing's ontology and epistemology, and as contextual issues considering the trends within the contemporary world. Furthermore, the theory of Technological Competency as Caring in Nursing (8) is described for an interdisciplinary study of relevance in the central issue of the integration of science and practice.

#### *Philosophical Issues/Theoretical Issues*

Reed clearly described nursing's domains of inquiry as a Philosophy of Science focusing on metaphysics and epistemology (2). Metaphysics involves the study of truth and reality, and as a branch of metaphysics, ontology refers to the nature, being and existence of things, while epistemology refers to how aspects. Ontology and epistemology of nursing are interconnected as a discipline of knowledge and a practice profession that practically deals with the study of reality and truth, being and existence of concepts, metaparadigms and interdisciplinary knowledge including its forms, relevance, and structure. Nursing ontological issues relate to questions of being while nursing epistemological issues relate to questions of knowledge. Nursing ontology focuses on the fundamental elements that exist in nursing, and nursing epistemology deals with how knowledge is known.

#### *Ontological Issues*

What is nursing in the contemporary age of information and technology? What is nursing in the future? What is the current and future substantive focus of nursing? What are the fundamental areas of inquiry in nursing today and in the future?

The ontological issues of contemporary nursing based on the literature review are : (a) focus on the integration of nursing science and nursing practice and (b) updates of nursing metaparadigms with caring in nursing as the focus of inquiry and knowledge development.

More than 50 years ago the discussions among nursing scholars were centered on whether the focus of nursing is caring, health, or the person (1, 9, 10). Roy identified the central issue of contemporary nursing as the integration of science and practice requiring precise definitions of nursing science and nursing practice. What is science in nursing? What defines the practice of nursing? Therefore, answers to these ontological questions require philosophical and theoretical realities. Nursing theories reflect the ontology of nursing (2).

#### *Rethinking Ontologies and Technologies*

Furthermore, the fundamental elements of nursing as the metaparadigms of nursing require re-thinking (3) and that caring in nursing is the focus of nursing inquiry (1, 9). This view requires nursing science to advance its disciplinary landscape to include a futurist perspective on an ontology that big data analytics may be able to address. Therefore, what is caring in the light of cybernetic organism (cyborg) ontology? What are the expressions of caring in the world of big data? Does caring exist in the virtual world in which social media is an essential element of human existence?

Ontological issues address arguments as to whether or not concepts such as caring, healing, and transcendence genuinely exist and are real (2) and integral to nursing ontology and epistemology. Other disciplines such as cognitive neuroscience, informatics, computer science, psychology, and biomedical science have considered exploring the concepts of emotional intelligence and virtual neuromodulators (11), artificial intelligence and Humanoid Nursing Robots (6, 7 & 12). Therefore, can emotionally intelligent human beings co-exist with artificially intelligent "anthropomorphic machines"? Moreover, ontological issues point out whether theory-practice gaps exist.

#### *Epistemological Issues*

"What kind of knowledge must be created for effective practice in

today's world?" (1)

Contemporary nursing is facing epistemological issues of (a) pluralism of nursing paradigms, and (b) application of diverse processes of knowledge development with disciplinary uniqueness and (c) the integration of theory in research methods infused with multiple ways of knowing guiding practice viewpoints.

Utilization of pluralism of nursing paradigms and epistemological worldviews contribute to the development of nursing knowledge (1). For example, the *particulate-deterministic* view considers phenomena as systematic and that change as linear and predictable is influenced by the physical sciences ; the *interactive-integrative* paradigm views phenomena as interconnected and contextual, and change is believed to be multifactorial and influenced by the social sciences ; and the *unitary-transformative* perspective in nursing, interprets phenomena as self-organizing and evolving and that change is considered elemental supporting the unpredictable influences of the human sciences (9).

Epistemological worldviews include post-positivism and realism, historicism and social constructionism, postmodernism and post-structuralism, critical theory and feminism, and inter-modernism (2). These worldviews influence knowledge development and thus the nature of knowledge in nursing is dependent on the lens through one uses.

The application of varied ways of knowledge development allow for gaining deeper insights into the discipline's nature, its epistemological issues in contemporary times focused on understanding how is knowledge known, communicated, tested, applied in practice, and integrated into influential health policies (1). Different methods of inquiry advance theory development in nursing producing new knowledge as discovered, synthesized, and ultimately shared. In the digital era of uncertainty and complexity, questions are asked, how is nursing knowledge formed to make it relevant and legitimate in today's world? How can innovative strategies for knowledge discovery stimulate nursing engagements, improve theory development and promote interdisciplinary practice?

Theory integration into research requires the development of conceptual models and frameworks (13) that represent the relationships of concepts within theories : those research studies that focus on hypothesis testing quantitative research or aims for explanatory/descriptive inquiries (qualitative research). Utilization of theory to guide research and consequently inform practice bridges the perceived gap of theory, research and practice. Contemporary nursing that is viewed as theory-based requires theory-based processes. After all, "theory guides practice, and practice grounds theory" (4) and through research the practice of nursing becomes evidence-based. "As a practice discipline, it is logical to assert that nursing theory is inextricably linked to practice" (14).

#### *Contextual Issues*

In a highly dynamic evolutionary globalized health care milieu, the universe opens to a myriad of possibilities. Context provides a space of focus on what truly matters at a point in time. In the case of theory development, these contexts include inter-disciplinarity and big data integration, publication and dissemination, and philosophical scholarship. Based on the synthesized contents of the selected literature, the following issues were identified : (a) Strengthening interdisciplinary relevance of nursing knowledge particularly on big data integration, (b) Advancing nursing science through publication and dissemination, and (c) marginalization of philosophical and conceptual scholarship (1).

In the context of interdisciplinary relevance and big data integration, both the ontology and epistemology of nursing interplay to form new knowledge and advance the extant concepts of the discipline. Rapidly developing sciences continue to influence knowledge development in nursing (4).

Theoretical structures are needed to be relevant in the worlds of

“omics,” big data, and translational science (3). Big data analytics from the nursing perspective will require conceptual quantum shifts thus the urgent need to further expand the descriptions of the metaparadigms of nursing to provide direction in developing theories. How is knowledge from other disciplines and sciences such as omics, big data, biomedical, health informatics (10), neuroscience and computer science integrated into nursing science? From the philosophical view, big data approaches the common goal of improving health and well-being particularly in acute care nursing (3). Big data analytics is essential to make sense of behavioral patterns, physiological changes and predict capacities to detect practice deteriorations or progressions.

The second contextual issue is advancing nursing science through knowledge dissemination. Roy (4) pointed out that availability of nursing journals and policies that prioritize original works focusing on existing nursing theories have limited the development of new theories. Accessibility and availability of published articles need to be addressed in this rapidly changing era of digital information. Scientific conferences have notable contributions to theory development and therefore must be enhanced through technology (4). Social media can be a useful networking tool for practice and the academic community particularly the use of popular platforms. However, these technological modes have not been widely explored thereby warrants further inquiry.

The third contextual issue is the marginalization of philosophical and conceptual scholarship considered a “vehicle for knowledge development” (1). Nurse scholars have experienced limitations in their potentials due to lack of funding for scholarly inquiry. Mostly favored for funding are research studies with empirical quantifiable results, often outcomes of generalizations being the priority. Conceptual and theoretical inquiry in nursing may not be valued as much as those empirically data-driven research studies making it hard for human science nurse theorists to secure funding (10).

With limited funding there will be limited development of innovative studies to support the burgeoning demand for nursing knowledge and therefore limited possibilities for applications of knowledge into practice. Ultimately, knowledge development and application can affect the health outcomes of the populations served.

## THE THEORY OF TECHNOLOGICAL COMPETENCY AS CARING IN NURSING (TCCN)

Based on the ontological and epistemological issues described, a theory of nursing that can be used to advance the reconciliation of the central issue of integration of science and practice is Locsin’s TCCN (7, 8, 15) theory. This middle range theory of nursing offers the potential for nursing knowledge development in the next decades within the context of interdisciplinary advancement of nursing science.

The TCCN theory of nursing addresses the contemporary issues of theory development and positions itself within the Universal Technological Domain (UTD) (7) as it continues to focus on the practice of nursing within human caring view. The theory provides the blueprint for building contextually relevant interdisciplinary knowledge in promoting quality health care and well-being.

Technological competency is reflected in the three shared dimensions of nursing process events; *technological knowing*, *mutual designing* and *participative engaging* which guide nursing practice (7). These processes are best understood using the unitary-transformative and human science ontological view, and the post-positivist epistemological perspective. TCCN is focused on the integration of the science and practice of nursing. “Nursing science connotes and denotes the unique body of knowledge embedded in the extant nursing frameworks and theories that continue to be developed through research and creative conceptualization” (16).

As such, TCCN promotes research approaches in nursing practice within a scientific stance, thereby advancing nursing science.

One aspect of the TCCN describes the nature of nursing practice as the promotion of health and well-being. The practice of nursing occurs in technological encounters between the person who is nursed (patient) and the nurse within the UTD (7). Fundamental to the practice of nursing is knowing the person as caring (7).

Nursing as a practice profession and a discipline of knowledge has rigorous research-derived knowledge for nursing practice (7). Therefore, in the integration of science and practice, TCCN informs and guides the practice of nursing within the interdisciplinary world.

### TCCN and Artificial Intelligence Machines

TCCN is highlighted as the co-existence of technology and caring in nursing through its dynamic, non-sequential and synchronistic nursing processes. For example, it is envisioned that through *technological knowing*, the conceptualization of automated robots (ARs) with artificial intelligence (AI) can inform future practices of nursing as actively participating in “knowing the fullness of the persons using its endowed technological capabilities (7, 12). Locsin (7) predicted that artificial general intelligence of ARs would exist before the end of the 21<sup>st</sup> Century. However AI applications are currently and may be applied in the future, this will make healthcare more efficient especially in hospitals (6) where AI may assist in making sense of voluminous data.

*Mutual designing* is the other innovative process of nursing that can allow ARs to participate in the plan and design of “mutual care processes” with the human nurse and the patient (7). This nursing process reflects the therapeutic engagements allowing for interdisciplinary integration that is vital to the extension of human capacity.

In *participative engaging*, the “alternating rhythm of implementation and evaluation” (7) will call for ARs and human nurses to engage in the simultaneous practice. There is a considerable challenge for TCCN to integrate the concept of big data analytics, cyborg ontology, biotechnology and informatics (17) in the health sciences. Does technological competency exist in the realm of big data, cybernetic organisms, anthropomorphic beings, and health informatics?

The TCCN can be used, revised, upgraded and advanced to address the philosophical issues of contemporary and futurist theory development in nursing. The pivotal role that TCCN has for interdisciplinary integration of science and practice of nursing will be more significant as the world’s contextual realities continue to evolve. The TCCN is a vantage point of all knowledge patterns informing theory-based nursing practice of the future.

More emphasis is proposed to advance middle range theories (9, 14) such as the TCCN theory (7, 8, 15) theory and other practice theories (2, 3, 10) through research utilization. Relevant and pragmatic knowledge can then be meaningfully shared with other disciplines. An emphasis on bridging this relevance gap of theory, research and practice is highlighted in collaborative activities (3, 4). Generation of new knowledge for the future (1), realignment of nursing doctoral education programs (10), and development of contemporary nurse scholars as stewards of the discipline (1, 3, 4, 10) are some of the ways that these can occur.

## CONCLUSION

Contemporary nursing emphasizes the nature of nursing as a discipline of knowledge and a practice profession (5), despite the challenges of divisiveness in perspectives among nurse scholars, nurse educators, practitioners, and researchers. Theory-based

practice of nursing in today's techno-advanced world is evident in the ontological perspectives grounding the co-extant (5, 12) interdisciplinary healthcare environment. Contemporary nursing continues to be highly predictive and prescriptive (12). However, the aims of contemporary theory development must continue to focus on informing practice, guiding nursing care and raising relevant questions that generate more knowledge for future nursing (1, 12). As nurses begin to accept the dilemma of the profession, they can start advancing practice to the future by integrating philosophical, conceptual and theoretical thinking into diverse methods of research inquiry, evidence-based and theory-based practice that shape the future of nursing.

TCCN is the middle range theory in nursing that provides a theoretical framework for practice theories to advance and develop based on the nursing ontology, epistemology and contextual realities surrounding nursing science. Innovative knowledge development is needed to stir nursing knowledge. It begins with the questions, *Is nursing prepared for the future? How can nursing adapt to the global quantum shift?*

## COMPETING INTERESTS

The author declares that she has no competing interests.

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## REFERENCES

1. Grace P, Willis D, Roy C, & Jones D : Profession at the crossroads : A dialog concerning the preparation of nursing scholars and leaders. *Nursing Outlook* 64(1) : 61-70, 2016
2. Reed P : Philosophical Issues and Nursing Science. *Nursing Science Quarterly* 31(1) : 31-35, 2018
3. Jairath N, Peden-McAlpine C, Sullivan M, Vessey J, & Henly S : Theory and Theorizing in Nursing Science : Commentary from the Nursing Research Special Issue Editorial Team. *Nursing Research* 67(2) : 188-195, 2018
4. Roy C : Key Issues in Nursing Theory : Developments, Challenges, and Future Directions. *Nursing Research* 67(2) : 81-92, 2018
5. Lim-Saco F, Kilat C, & Locsin R : Synchronicity in Human-Space-Time : A Theory of Nursing Engagement in a Global Community. *International Journal for Human Caring* 22(1) : 1-10, 2018
6. Tanioka T : The Development of the Transactive Relationship Theory of Nursing (TRETON) : A Nursing Engagement Model for Persons and Humanoid Nursing Robots. *International Journal of Nursing and Clinical Practices* 4(223) : 1-8, 2017
7. Locsin R : The Co-existence of Technology and Caring in the Theory of Technological Competency as Caring in Nursing. *The Journal of Medical Investigation* 64 : 160-164, 2017
8. Locsin R : Technological Competency as Caring in Nursing : A Model for Practice. Sigma Theta Tau International Honor Society of Nursing Press, Indianapolis, IN, 2005
9. Cook L, & Peden A : Finding a Focus for Nursing : The Caring Concept. *Advances in Nursing Science* 40(1) : 12-23, 2017
10. Tobbell D : Nursing's Boundary Work : Theory Development and the Making of Nursing Science, ca. 1950-1980. *Nursing Research* 67(2) : 63-73, 2018
11. Talanov M., & Toshev A : "Artificial Emotions via Virtual Neuromodulators." Conference Paper. August 2014. [https://www.researchgate.net/publication/260250174\\_Artificial\\_Emotions\\_via\\_Virtual\\_Neuromodulators](https://www.researchgate.net/publication/260250174_Artificial_Emotions_via_Virtual_Neuromodulators), (June 12, 2018)
12. Locsin R : Theory-Based Nursing Practice in the World of Anthropomorphic Intelligent Machines. *Shikoku Acta Medica* 73(5,6) : 227-232, 2017
13. Drevdahl D : Culture Shifts : From Cultural to Structural Theorizing in Nursing. *Nursing Research* 67(2) : 146-160, 2018
14. Liehr P, & Smith M : Middle Range Theory : A Perspective on Development and Use. *Advances in Nursing Science* 40(1) : 51-63, 2017
15. Locsin R : Technological Competency as Caring in Nursing : Co-creating Moments in Nursing Occurring Within the Universal Technological Domain. *The Journal of Theory Construction and Testing* 20(1) : 5-11, 2016
16. Parse, R. R : Nursing Science or Is It the Science of Nursing? *Nursing Science Quarterly* 28(2) : 101-102, 2015
17. Monteiro A : Cyborgs, biotechnologies, and informatics in healthcare-new paradigms in nursing sciences. *Nursing Philosophy* 17 : 19-27, 2016