

Human patient simulation manikins and information and communication technology: Use and quality indicators in Australian schools of nursing.

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Thesis submitted for the degree of Master of Philosophy (Nursing)

Date

30th September, 2013

Statement of Originality

The thesis contains no material that has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. I give consent to the final version of my thesis being made available worldwide when deposited in the University's Digital Repository, subject to the provisions of the Copyright Act 1968.

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Declaration: Thesis by Publication

I hereby certify that this thesis is submitted in the form of a series of published papers of which I am a joint author. I have included as part of the thesis a written statement from each co-author; and endorsed by the Faculty Assistant Dean (Research Training), attesting to my contribution to these joint publications.

Carol Arthur

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I would also like to thank all the study participants, both those who completed the survey of Australian schools of nursing, and also the members of the expert Delphi panel, for their time and the insights provided.

I hereby certify that the work embodied in this thesis has been conducted as part of an Australian Learning and Teaching Council (ALTC) funded project (Project number CG10-1678). As such this work has been conducted solely by myself as the Master of Philosophy candidate, with consultation with the project group members and project reference group being utilised only for advice and validation of the survey instruments. I would like to thank the project and reference group members for their contribution.

Carol Arthur

List of publications included as part of the thesis

Arthur, C., Kable, A. and Levett-Jones, T. (2011). Human patient simulation manikins and information communication technology use in Australian schools of nursing: A cross-sectional survey. *Clinical Simulation in Nursing* 7(6), e219-27.

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In the case of paper one the nature and extent of contribution to the work was the following:

Carol Arthur prepared and submitted the application for ethics approval for the research to proceed, reviewed the literature, developed the survey instrument, conducted the online survey, analysed the data and drafted the manuscript for publication. Associate Professor Ashley Kable and Professor Tracy Levett-Jones contributed to the above in their capacity of the role of Master of Philosophy supervisors.

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Declaration by co-authors

The undersigned hereby certify that:

1. the above declaration correctly reflects the nature and extent of the candidate's contribution to this work, and the nature of the contribution of the co-authors;
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3. they take public responsibility for their part in the publication, except for the responsible author who accepts overall responsibility for the publication;
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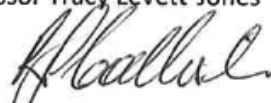
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Carol Arthur prepared and submitted the application for ethics approval for the research to proceed, reviewed the literature, developed the Delphi instruments, conducted the online Delphi rounds, analysed the data and drafted the manuscript for publication. Associate Professor Ashley Kable and Professor Tracy Levett-Jones contributed to the above in their capacity of the role of Master of Philosophy supervisors.

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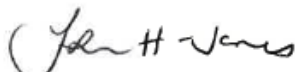
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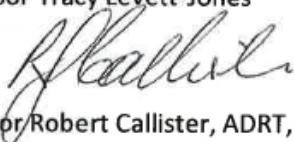


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Kable, A., Arthur, C. and Levett-Jones, T. and Reid-Searl, K. (2013). Student evaluation of simulation in undergraduate nursing programs in Australia using quality indicators. *Nursing and Health Sciences* 15(2), 235-243.

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McAllister, M., Levett-Jones, T., Downer, T., Harrison, P., Harvey, T., Reid-Searl, K., Lynch, K., Arthur, C., Layh, J. and Calleja, P. (2013). Snapshots of Simulation: Creative strategies used by Australian educator to enhance simulation learning experiences for nursing students. *Nurse Education in Practice*.

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Conference Presentations:

Arthur, C., Kable, A., Levett-Jones, T. (2009). Human patient simulation manikin and information communication technology use in Australian nurse education. Third International Clinical Skills Conference, Prato, Italy. 1st-3rd July, 2009.

Arthur, C., Kable, A., Levett-Jones, T. and Bourgeois, S. (2009). Human patient simulation manikin and information communication technology use in Australian nurse education. Australasian Nurse Educators Conference, Christchurch, N.Z. 30th September-2nd October, 2009.

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Arthur, C., Roche, J. Levett-Jones, T., Hoffman, K., Kable, A. and Hunter, S. (2010). The simulation "Pot of Gold"; How should we spend it? SimTecT Health 2010, Melbourne. 30th August-2nd September, 2010. **Awarded Best Poster Abstract**

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Synopsis

Against a background of escalating complexity within the Australian health care system related to the health needs of an ageing population, combined with a shortage of nurses, Australian schools of nursing have been asked to provide education and training for increasing numbers of students. However busy and at times overstretched clinical venues with high levels of patient acuity and a lack of experienced nursing staff have resulted in clinical learning environments that are unpredictable in quality and availability. Simulation has been proffered as a strategy that can address some of these issues.

Simulation in its simplest forms has been used for many years in nursing education. Technological advances over the last decade have provided high fidelity human patient simulation manikins (HPSM) that are able to mimic patients' physiological changes as well as provide life-like characteristics such as breathing, blinking and talking. These manikins, along with advances in information communication technology (ICT), provide increased opportunities for nursing students to engage in realistic clinical scenarios in a safe learning environment. In particular, the ability to simulate the physiological changes occurring in a deteriorating patient, combined with student access to current information through ICT, provides a learning experience that has the potential to improve higher order thinking, clinical reasoning and clinical communication, as well as basic psychomotor skills.

At the inception of this study in 2009 Australian schools of nursing were beginning to embrace HPSM and ICT as new and exciting teaching strategies, but little was known about the way in which these new strategies were being utilised. There was also a lack of clear direction as to what constituted quality teaching in the use of simulation manikins and ICT. The overall aims of this study were therefore to explore the use of simulation and ICT in Australian schools of nursing undergraduate programs, in particular in relation to clinical laboratory and simulation unit activities, and to determine what constituted quality use of simulation and ICT for teaching and assessment of undergraduate nursing students.

A pragmatic, mixed method approach was adopted to achieve the stated aims, with the study conducted in two phases. A cross sectional survey of Australian schools of nursing provided a snapshot of current use of simulation and ICT. This was followed by a Delphi study, in which an international panel of experts were utilised to achieve consensus regarding what constituted quality in the use of HPSM and ICT in simulation learning activities within an undergraduate nursing curriculum. The outcome of this study was a set of Quality Indicator Statements which can be used to guide the design and implementation of simulation activities within nursing curricula, as well as evaluate the quality of existing simulation programs. These statements have demonstrated applicability to a range of simulation modalities and have potential for use in nursing education, research and policy development.

This thesis is present as a hybrid thesis by publication. A comprehensive literature review and an overview of the study method are provided. These are followed by two chapters that present published papers, including findings from the cross sectional survey and the Delphi study. The final chapter draws together key aspects of both phases of the study and discusses the overall significance and implications.