



A conceptual framework for simulation in healthcare education — The need

Irwyn Shepherd^{a,*}, Trish Burton^b

^a Monash University Office of Learning and Teaching, Monash University, Scenic Boulevard, Clayton 3800, Victoria, Australia

^b College of Health and Biomedicine, Victoria University, P.O Box 14428, Melbourne 8001, Victoria, Australia



ARTICLE INFO

Keywords:

Simulation
Conceptual framework
Health care education
Learning and teaching
Modality

ABSTRACT

This study used a social constructivist approach to explore the literature in relation to the acknowledgment and application of models and frameworks in simulation based learning and teaching activities in health care education. This paper addresses the data collection phases in the research design in developing a Conceptual Framework for Simulation in Healthcare Education.

Background: Two literature review activities occurred in the study. The first literature review explored the challenges in the literature for further research in relation to the educational factors that have an impact upon simulation as a learning and teaching modality. This part of the research process was to identify the publications that address simulation as a learning and teaching modality and uncover evidence to justify the study. The literature revealed that there were limited publications in relation to simulation as a learning and teaching modality that was underpinned by a conceptual framework.

Design: The study research design employed Evaluation Research to conduct a further intensive review of the literature as part of phase one of data collection. The second part of phase one of data collection was the surveying of randomly selected simulation education centres around the world to ascertain their employment of a conceptual framework in the application of simulation as a learning and teaching modality. Phase two was the genesis of the conceptual framework and Phase three was the evaluation of the draft framework using a modified Delphi Technique by randomly selected simulation experts.

Results: The intensive literature review highlighted that authors acknowledged education-based theories but this did not extend to the application of a conceptual framework to simulation as a learning and teaching modality. The survey provided the evidence to support the development of a Conceptual Framework for Simulation in Healthcare Education for the conceptualisation, design, development and delivery of simulation teaching and learning activities in health care education. The simulation experts provided valuable data and commentary in the final formation of the conceptual framework.

Conclusion: Based on the outcomes of the literature review, questionnaire and modified Delphi Technique the need for the development, and subsequent structure and utility of the Conceptual Framework for Simulation in Healthcare Education was verified.

1. Introduction

As a prequel to the study an extensive literature review on the use of simulation in healthcare was undertaken. This precursor literature review helped set the context given it provided the diverse definitions of, the history behind, the current global view of and the range of the contemporary state of healthcare simulation uptake. The review of the simulation literature also demonstrated that the current and emerging healthcare simulation community is an extensive, complex, international movement that transcends nationalities, customs, cultures, academia, clinical services and research activities.

1.1. Research genesis

As a result this research's genesis was threefold. The first activity was to identify and respond to commentary and recommendations in the literature of the need for further research into the pedagogical underpinnings of simulation (Harris et al., 2013; Issenberg et al., 2011). This gave focus to and generated the first two questions of the study:

- What conceptual frameworks and theoretical models are cited in the literature that informs simulation interventions?
- Do the identified conceptual frameworks and theoretical models inform and guide the design, delivery and evaluation of simulation

* Corresponding author.

E-mail addresses: irwyn.shepherd@monash.edu (I. Shepherd), t.burton@vu.edu.au (T. Burton).

<https://doi.org/10.1016/j.nedt.2019.01.033>

Received 5 April 2018; Received in revised form 22 November 2018; Accepted 28 January 2019

0260-6917/ © 2019 Elsevier Ltd. All rights reserved.

interventions?

These questions led to the exploration and review of the literature to identify any existing theoretical models and conceptual frameworks that were used as platforms for simulation activities in health care education, and secondly a data collection exercise to ascertain to what degree frameworks and models were being applied. To reduce ambiguity, the definition for the Conceptual Framework for Simulation in Healthcare Education is a theoretical model designed to ensure the efficacy of simulation as a teaching, learning and assessment method. It is the construct of a framework that will encourage development of a standard in how simulation education may be best used (Shepherd, 2017). This conceptual framework was evaluated by simulation experts using a modified Delphi Technique as part of the social constructivist perspective of the study.

1.2. Literature

Current research has indicated that there is limited availability and application of theoretical models and conceptual frameworks in simulation as a learning and teaching modality in health care education, including the existence of significant gaps in the identification and application of education theories in simulation (Kaakinen and Arwood, 2009; Murdock, 2012; Rourke et al., 2010). The further data collected informed the development of a conceptual framework that is intended to address the initial commentary and recommendations by authors and the identified gaps in the literature. The “Conceptual Framework for Simulation in Healthcare Education” was created to inform, guide and augment the design, delivery and evaluation of simulation as a learning and teaching method in health care education.

1.3. Background

There are a number of drivers for simulation as a learning and teaching modality in health care education, and these include the failure of traditional learning models, the changing clinical environment for the student experience, shorter clinical exposure opportunities for patient care and an increased focus on patient safety (Ker and Bradley, 2010). From the health care industry stance, there is an increasing requirement for a work ready and work safe health care professionals (Caballero et al., 2011; Walker et al., 2013). This requirement for more skilled health care professionals by the health care industry has led to an increased demand for more student clinical placements by health care education providers. In turn, this has led to a reduction in clinical placement opportunities and capacity that are appropriate and relevant for meaningful student-focused learning experiences (Health Workforce Australia, 2010; James, 2005; National Review of Nursing Education, 2002; Shepherd, 2008; Shepherd et al., 2007). The provision of appropriate clinical placements relies heavily on the capacity and capability of the existing health care workforce to support students, but this is in conjunction with increased workloads of health care professionals providing direct patient care. This has led to deficits in the articulation of theory to practice, skills acquisition, interdisciplinary team interactions and other activities such as addressing clinical human factors to students in the provision of patient care (Health Workforce Australia, 2010; James, 2005; National Review of Nursing Education, 2002; Royal College of Nursing, 2018; Shepherd, 2008; Shepherd et al., 2007).

1.4. Literature

Educators in the health care disciplines have repeatedly identified the need for further research in relation to the use of simulation as a learning and teaching method, with consensus that simulation should be grounded with a theoretical or conceptual framework (Issenberg et al., 2011). In response to this there has been research conducted on

the application of various education theories to support simulation learning and teaching activities (Doerr and Murray, 2008; Humphreys, 2013; Jeffries and Rogers, 2007; Kayes et al., 2005; Keskitalo, 2015; Parker and Myrick, 2009; Sowerby, 2015; Zigmont et al., 2011). However, the literature indicates that this has not translated into any significant development of robust education theory-based frameworks.

One of the first frameworks to emerge for nursing was the Jeffries simulation framework (Jeffries, 2007) who contends that student-learning outcomes are influenced by the concepts of teacher, student, educational practices and simulation design characteristics. In attempts to ascertain its impact the literature reveals that, on the surface, it appears there has been limited uptake in, and the contextual application of, the Jeffries framework (2007). However, there have been a number of subsequent evaluations of this framework with regard to effective student learning (Young and Shellenbarger, 2012).

LaFond and Van Hulle (2013) also conducted a literature review of the Jeffries Simulation Framework for evidence where the framework was employed as a teaching modality or guided research. Increased student satisfaction, confidence, and improved skill performance were identified in the literature review. Fawcett's criteria for theory analysis and evaluation (Fawcett, 1980; Fawcett, 2005) were applied to the Jeffries Simulation Framework, and the outcome of the evaluation was that the framework guides the design and delivery of simulation interventions that result in positive outcomes for students. However, there was the identification of areas where the framework could be modified or strengthened, as in well-defined concepts, recommendations for validity and reliability, testing of concept relationships and determining the relevancy of concept variables. LaFond and Van Hulle (2013) acknowledge that there is widespread use of simulation as a learning and teaching modality in the preparation of nurses globally, hence there is the recommendation for a framework to guide educators in developing and facilitating simulation that is effective for the learner.

It is essential to note that while the Jeffries Framework supports simulation design, it does not include the application of educational theory underpinnings. Evidence of this is demonstrated where Pollard and Nickerson (2011) note the need to identify the key components of educational theory specific to simulation. In response to this they sketch a model for simulation in staff development which is an adaptation from the Theoretical Framework for Simulation Design by Jeffries and Rogers (2007). Meanwhile Huang et al. (2008) describe outcomes of a summit where discussions focused on standards for simulation-based applications. A subsequent preliminary draft of a guideline for simulation-based education was developed and this has since become a published taxonomy.

It is significant that there is emphasis towards improved educational preparation and development of simulation educators to ensure simulation learning activities have greater education rigour, with activities that are effectively designed, delivered and evaluated. This is supported by Lambton and Prion (2009) who recommend that educators need to possess clinical, technical and education expertise. Meanwhile Alinier and Platt (2013) assert that more attention should be given to how the learners are educated using simulation and less on the simulation tools. A recent publication demonstrates once again the focus on elements of a conceptual framework however it does not consider a number of important educational theories. Hicks et al. (2013) too propose the use of a template in a framework that would support integration of content knowledge, clinical reasoning, and reflection on authentic professional nursing concerns.

The literature indicates that it is timely to develop a conceptual framework for simulation as a learning and teaching modality that builds meaningful learning experiences for students. The articulation of a conceptual framework for simulation as a learning and teaching modality would offer health care educators the best model to design and deliver, assess and evaluate simulation based learning activities in health care education.

2. Methods

The qualitative research design of Evaluation Research was employed which reviewed the literature and conducted a survey of selected simulation centres around the world. According to Powell (2006) evaluation research can be defined as ‘a type of study that uses standard social research methods for evaluative purposes, as a specific research methodology, and as an assessment process that employs special techniques unique to the evaluation of social programs’(p.102).

Silver and Pratt (2006) indicate that evaluation is a systematic approach to acquiring and assessing information so as to generate appropriate feedback about an object, which is the focus and intent of this research. It is projected that subsequent to the preliminary literature search and analysis of data collected, the information gathered will provide context and a scaffold that will guide development of the Conceptual Framework for Simulation in Healthcare Education.

To reinforce this objective there is another pertinent definition in connection with the evaluation of educational activities provided by Adelman and Alexander (1982), who identify such evaluation as involving the forming of opinions and deciding on the value and effectiveness of educational strategies and activities, and the investment required for these strategies and activities. This supports the intent of the study as it involved the gathering of constructive feedback by questionnaire followed by a modified Delphi technique (Green, 2014; University of Illinois, 2013; Yousof, 2007) that addressed those elements mentioned and thus guided further development of the conceptual framework to where it was ready for contextual evaluation.

2.1. Ethics

The application to undertake this research project was accepted and deemed to meet the requirements of the National Health and Medical Research Council (NHMRC) ‘National Statement on Ethical Conduct in Human Research’ (2007) by the University Human Research Ethics Committee. Participants in the research were provided with precise, non-technical information and clear common language explanations regarding the research proposal. This was to ensure participants will be able to provide informed consent, participants will be offered confidentiality, and, participants will be offered an opportunity to review outcomes of the research.

Given the nature of the research activity it was believed there was negligible or no real or potential risks to the participants of this study. Nevertheless all care was undertaken when explanations were provided and informed consent sought. All participants had the option of withdrawing from the project if they believed they were becoming compromised in any manner.

The potential benefits to the participants and contributions to the general body of knowledge significantly outweighed any potential or real risk. The ethical benefit identified was that future simulation education development will be of an educational standard that will generate improvements in healthcare practice outcomes. There were no identified legal issues or legal risks associated with any aspect of the research that require specific consideration including those related to participation in the research, the aims and nature of the research, research methodology and procedures, and/or the outcomes of the

research.

2.2. Data collection

The first phase of data collection involved an extensive and systematic literature search to determine the depth and range of literature that addressed the use of frameworks or models in simulation based teaching methods. This information was further analysed, with the data indicating the need to seek further evidence in relation to the use of conceptual frameworks underpinning simulation as a learning and teaching modality. As a result the second component of phase one data collection, that being a survey, with a set of ethics approved targeted questions, was made available to a pre-determined number (n = 30) of randomly selected simulation centres. A database of national and international simulation centres provided this opportunity.

Participants were provided with a description of the study and a written consent form, and upon the receipt of the completed consent forms, the participants received a questionnaire. The questionnaire’s foci was to ascertain whether a model or framework were employed as a basis for guiding simulation based learning and teaching activities at each centre. The questionnaire, from a needs analysis and forward design perspective, was developed to obtain baseline data on the existence and use, or not, of a framework or similar model.

Data collection was by return e-mail. There were minimal delays in responses thus significant follow-up emails to ensure a reasonable return rate were not required. The return of completed questionnaires was within the two-month timeframe. The feedback from the questionnaires sent out in the simulation centre survey was reviewed and collated. This included numerical and commentary data. The numerical data were analysed using descriptive statistics of numbers and percentages. The thematic analysis approach was applied to the written comments, with the distillation of key words and phrases to provide themes.

Phase two was the development of the conceptual framework, informed by the outcomes of the literature review and the outcomes of the simulation centre survey by questionnaire. The framework was based on an educational complexity format that commences with Adult Learning Theory and concludes with Deliberate Practice and Acquisition of Expert Performance. The third phase was the evaluative review by six simulation experts using a modified Delphi Technique. The evaluative review comprised of a questionnaire with numerical data and written commentary. The numerical data analysis was in the form of numbers and percentages. Thematic analysis distilled key words and phrases to highlight themes.

3. Results

The conducted in-depth literature review reported the application of various education theories to validate particular simulation teaching activities, with the literature pointing out that when simulation as a learning and teaching modality was in operation, often the link between educational theories and learning models with simulation based learning outcomes was not often articulated.

The participant response rate to the questionnaires was 19/30 (63.3%), with the numerical data statistically analysed (Table 1) and

Table 1
Outcomes of questionnaire sent to simulation centres.

Questionnaire: Response rate 19/30 (63.3%)	Yes	No
	(n = x)/%	(n = x)/%
Q1. Does your organisation utilize a conceptual framework for simulation education development?	(n = 12)/63.16%	(n = 7)/36.84%
Q2. As an organisation do you use a conceptual framework to facilitate the evaluation and research of your simulation experiences?	(n = 8)/42.11%	(n = 11) 57.89%
Q3. If your organisation had access to a validated conceptual framework for simulation education development would you consider using it?	(n = 17) 89.5%	(n = 2) 10.5%

the commentary data were reviewed and collated. The initial questions in the survey requested a response to whether the organisation that they worked in utilised a conceptual framework for simulation education development and delivery. While 12/19 (63%) of participants identified that they utilised a conceptual framework for simulation education delivery, 9/19 (37%) of participants responded that their organisation did not employ a model to drive simulation based learning activities. As the 'no' response was over one third ($\frac{1}{3}$) of the total response, this provided an opportunity to both address and increase the exposure to, the use of conceptual frameworks by developing a framework that meets the need of educators in health care education and their respective organisations.

There was a range of comments provided and thematically they demonstrated the diversity of responses in how a conceptual framework was understood. This understanding includes what a conceptual framework is, why it is used, when it is used, where it is used and how it is used. While there were no strong theme(s) emerging, there was some demonstration by some of those who responded that they were able to identify education theories and models and their function.

From a summative perspective one could surmise that this information could be considered less representative of the utilization 'picture'. There was a limited response (7/19) to the question of whether their organisation considered employing a conceptual framework, and a small number (5/7) identified that they would consider employing one, if given the opportunity. This potentially represents an opportunity to demonstrate the benefits of a Conceptual Framework for Simulation in Healthcare Education.

The question of whether as an organisation did they use a conceptual framework to facilitate the evaluation and research of their simulation experiences, while 8/19 (42%) responded that they did employ a conceptual framework in the evaluation and subsequent research activities of simulation based education, 11/19 (58%) indicated they did not. The 58% response supports the need for further explanation and demonstration of the use of conceptual frameworks as a driver for effective learning and teaching activities. When the question was asked whether the participant's organisation considered employing a conceptual framework for simulation education evaluation and research activities, the answers were variable and indicated once more that there is not a clear understanding about what a conceptual framework can offer. While it was made very clear what a conceptual framework is and what it provided, it would appear, from the answers that the respondents did not identify how such a framework could be of benefit in guiding the design, delivery and evaluation of simulations.

The participants were asked, if their organisation did have access to a validated conceptual framework for simulation education development would they consider using it, 17/19 (89.5%) responded that they would consider using a conceptual framework, whilst 2/19 (10.5%) of the participants stated they would not use a validated conceptual framework. Based on the response rate and the comments made there was the theme of acceptance. There were different reasons provided, but essentially the majority of participants see the provision of such a tool as positive and indicate why that might be, in relation to their individual requirements.

The data and themes demonstrated that there remains a need for and supported the development of, a conceptual framework. The reported outcomes of the literature review and the constructive responses to the questionnaire from the Simulation Centres, thus supported the third research question which was:

- What best constitutes the design of a conceptual framework that will contribute to the design, delivery and evaluation of simulation interventions?

Using this question as a guide and driver, research proceeded to the construction of, and the testing by modified Delphi technique of, a draft Conceptual Framework for Simulation in Healthcare Education. Six

simulation experts provided critique and commentary that directed the completion of the Conceptual Framework for Simulation in Healthcare Education.

4. Discussion and conclusion

The study was about responding to the requests around the need for development and provision of an educational tool and process for educators to extract a clearer, more precise set of information to guide simulation intervention development, delivery, evaluation and assessment. The literature demonstrated that it could be argued that it is timely and relevant to develop such a tool – a conceptual framework for simulation activities – that builds on and potentially complements existing activities. While a number of authors acknowledged education theories in the context of their writings, there was a paucity of evidence that discussed the application of a conceptual framework. Thus the evidence indicated the potential for development of such a focused conceptual framework that would support simulation in health care education.

As there was little evidence of conceptual frameworks being implemented on the information gathered, it is important to determine what best constitutes the design of a conceptual framework that will inform and guide the design, delivery and evaluation of simulation interventions. There is a challenge to develop a conceptual framework in which relevant and pertinent educational theories are overtly identified and transparently applied to guide development, delivery and evaluation of training, including the use of simulation.

That being the case it is argued that contemporary simulation use is beneficial when it is supported by a sound educational underpinning. The development and use of a conceptual framework for simulation would thus appear to be an important foundational tool to guide simulation intervention development, delivery, evaluation and assessment across all healthcare disciplines and as a consequence ensure that the simulation intervention generates the desired educational impact - based on the identified learning outcomes. Thus, the development of a conceptual framework germane to simulation that draws on education theories could contribute to the healthcare education field.

The driver of this study was that a conceptual framework is an essential tool for the conceptualisation, design, development and delivery of simulation teaching and learning activities in health care education. The results from the literature reviews and simulation centre questionnaire provided further evidence to support the development of the Conceptual Framework for Simulation in Healthcare Education. The prototype of the Conceptual Framework for Simulation in Healthcare Education was evaluated by simulation experts to further refine the framework. The recommendations for the Conceptual Framework for Simulation in Healthcare Education are the implementation of the model and its efficacy in supporting simulation as a learning and teaching modality.

Declaration of interest

No incentives, personal or otherwise have been provided for the development of this paper.

Funding sources

The corresponding author was awarded the Australian College of Nursing Florence Nightingale Scholarship for a Doctoral Program for this doctoral study.

Ethical approval details

Victoria University Ethics Committee granted ethical approval for the conduct of this research.

References

- Adelman, C.R.J., Alexander, R.J., 1982. *The Self-evaluating Institution: Practice and Principles in the Management of Educational Change*. London, Methuen, 5.
- Alinier, G., Platt, A., 2013. International overview of high-level simulation education initiatives in relation to critical care. *Nurs. Crit. Care*. 1–8.
- Caballero, C.L., Walker, A., Fuller-Tyszkiewicz, M., 2011. The work readiness scale (WRS): developing a measure to assess work readiness in college graduates. *Journal of Teaching and Learning for Graduate Employability* 2 (2), 41–54.
- Doerr, H., Murray, B., 2008. How to build a successful simulation strategy: the simulation learning pyramid. In: Kyle, R., Murray, W. (Eds.), *Clinical Simulation Operations, Engineering and Management*. Elsevier, Burlington, MA, pp. 771–785.
- Fawcett, J., 1980. A framework for analysis and evaluation of conceptual models of nursing. *Nurse Educ.* 5 (6), 1–14 November/December.
- Fawcett, J., 2005. Criteria for evaluation of theory. *Nurs. Sci. Q.* 18 (2), 131–135 April.
- Green, R.A., 2014. The Delphi technique in educational research. In: *Sage Open*, pp. 1–8. April–June. Retrieved from: <http://sgo.sagepub.com/content/4/2/2158244014529773>.
- Harris, K.R., Eccles, D.W., Ward, P., Whyte, J., 2013. A theoretical framework for simulation in nursing: answering Schiavenato's call. *J. Nurs. Educ.* 52 (1), 1–16.
- Health Workforce Australia, 2010. Use of simulated learning environments (SLE) in professional entry level curricula of selected professions in Australia. *Health Workforce Australia* 1–26.
- Hicks, R.B., Geist, M.J., House, M.J., 2013. SAFETY: an integrated clinical reasoning and reflection framework for undergraduate nursing students. *J. Nurs. Educ.* 52 (1), 59–62 Jan.
- Huang, Y.M., Plieg, J.F., Henrichs, B., Bowyer, M.W., Siddall, V.J., Mcgaghie, W.C., Raemer, D., 2008. 2007 simulation education summit. *Simul. Healthc.* 3, 186–191.
- Humphreys, M., 2013. Developing an educational framework for the teaching of simulation within nurse education. *Open Journal of Nursing* 3, 363–371.
- Issenberg, B.S., Ringsted, C., Østergaard, D., Dieckmann, P., 2011. Setting a research agenda for simulation-based healthcare education: a synthesis of the outcome from an Utstein style meeting. *Simul. Healthc.* 6, 155–167.
- James, R., 2005. Reducing overcrowding on student practice placements. *Nurs. Times* 101, 28–32.
- Jeffries, P.R. (Ed.). (2007). *Simulation in Nursing Education: From Conceptualization to Evaluation*. New York, National League for Nursing.
- Jeffries, P.R., Rogers, K.J., 2007. Theoretical framework for simulation design. In: Jeffries, P.R. (Ed.), *Simulation in Nursing Education: From Conceptualization to Evaluation*. National League for Nursing, New York p. 23.
- Kaakinen, J., Arwood, E., 2009. Systematic review of nursing simulation literature for use of learning theory. In: *Education Faculty Publications and Presentations*. Paper 6.
- Kayes, A.B., Kayes, D.C., Kolb, D.A., 2005. Experiential learning in teams. *Simul. Gaming* 3, 330–354.
- Ker, J., Bradley, P., 2010. Simulation in medical education. In: Swanwick, T. (Ed.), *Understanding Medical Education: Evidence, Theory and Practice* (chapter 12). Association for the Study of Medical Education, pp. 164–180.
- Keskitalo, T., 2015. Designing a pedagogical model simulation-based healthcare education. In: *Acta Universitatis Lapponiensis* 299. Lapland University Press, Rovaniemi.
- LaFond, C.M., Van Hulle, V.C., 2013. A critique of the National League for Nursing/Jeffries simulation framework. *J. Adv. Nurs.* 69 (2), 465–480 Feb.
- Lambton, J., Prion, S., 2009. The value of simulation in the development of observational skills for clinical microsystems. *Clinical Simulation in Nursing* 5, e137–e143.
- Murdock, N.L. (2012). *Systematic literature review: a best practices review of simulated education approaches to enhance collaborative healthcare*, MSN Thesis, University of British Columbia, Okanagan, Canada.
- National Health and Medical Research Council (NHMRC), 2007. *National Statement on Ethical Conduct in Human Research*. <https://www.nhmrc.gov.au/guidelines-publications/e35>.
- National Review of Nursing Education, 2002. *Our Duty of Care*. Department of Education, Science and Training, Canberra, Australia.
- Parker, B.C., Myrick, F., 2009. A critical examination of high-fidelity human patient simulation within the context of nursing pedagogy. *Nurse Educ. Today* 29, 322–329.
- Pollard, M., Nickerson, M., 2011. The use of multi-dimensional simulation to promote communication and collaboration in patient care. In: PowerPoint Presentation. Exeter Hospital, Inc., Exeter, New Hampshire, USA Retrieved from: <http://connection.ebscohost.com/c/abstracts/65930430/abstracts-poster-presentations-use-multi-dimensional-simulation-promote-communication-collaboration-patient-care>.
- Powell, R.R., 2006. Evaluation research: an overview. *Libr. Trends* 55 (1), 102–120 Summer.
- Rourke, L., Schmidt, M., Garga, N., 2010. Theory-based research of high fidelity simulation use in nursing education: a review of the literature. *Int. J. Nurs. Educ. Scholarsh.* 7 (Article11) Retrieved from: <http://www.ncbi.nlm.nih.gov/pubmed/20361859>.
- Royal College of Nursing, 2018. *Patient Safety and Human Factors*. Accessed 2018. <https://www.rcn.org.uk/clinical-topics/patient-safety-and-human-factors>.
- Shepherd, I.A. (2008). *Barriers to and overcoming challenges in simulations*. PowerPoint Presentation. Invited Presentation to Victorian Managed Insurance Authority (VMIA). (Unpublished).
- Shepherd, I., 2017. A conceptual framework for simulation in healthcare education. In: Doctor of Education Thesis. Victoria University Research Repository. http://vuir.vu.edu.au/35047/1/SHEPHERD%20Irwyn-Thesis_nosignatures.pdf.
- Shepherd, I.A., Kelly, C.M., Skene, F.M., White, K.T., 2007. Enhancing graduate nurses' health assessment knowledge and skills using low-fidelity adult human simulation. *J. Soc. Simul. Healthc.* 2 (1), 16–24.
- Silver, H., Pratt, N., 2006. *Evaluation Research in Education*. Faculty of Education, University of Plymouth, UK Retrieved from: <http://www.edu.plymouth.ac.uk/resined/evaluation>.
- Sowerby, H., 2015. *Recent Graduates' Perspective on the Efficacy of Nursing Simulation Laboratory Experiences*. Project Study Submitted in Partial Fulfilment of the Requirements for the Degree of Doctor of Education. Walden University, pp. 1–111. August 2015. Retrieved from: <http://scholarworks.waldenu.edu/cgi/viewcontent.cgi?article=1554&context=dissertations>.
- University of Illinois. (2013). Retrieved from: <http://www.communitydevelopment.uiuc.edu/sp/Step6/Delphi%20Technique.pdf>.
- Walker, A., Yong, M., Pang, L., Fullarton, C., Costa, B., Dunning, A.M.T., 2013. Work readiness of graduate health professionals. *Nurse Educ. Today* 33, 116–122.
- Young, P.K., Shellenbarger, T., 2012. Interpreting the NLN Jeffries framework in the context of nurse educator preparation. *J. Nurs. Educ.* Aug. 51 (8), 422–428.
- Yousuf, M.I., 2007. Using experts' opinions through Delphi technique. *Pract. Assess. Res. Eval.* 12 (4) Retrieved from: <http://pareonline.net/getvn.asp?v=12&n=4>.
- Zigmont, J.L., Kappus, L.J., Sudikoff, S.N., 2011. The 3D model of debriefing: Defusing, discovering, and deepening seminars in perinatology. *Simulation in the Perinatal Environment* 35 (2), 52–58 April.