

Design of a Reflective Briefing Model for Bridge Simulator Training for Cadets at the Surabaya Merchant Marine Polytechnic

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Abstract

Bridge simulator learning is a core component of nautical cadet training because it allows learners to practise watchkeeping, collision avoidance, communication, and navigational decision-making in realistic but controlled scenarios. However, simulator sessions do not automatically produce reflective learning. Without a structured debriefing process, cadets may remember the technical sequence of the exercise but fail to analyse why decisions were effective, why errors occurred, and how lessons should be transferred to future bridge watch situations. This article aims to design a reflective debriefing model for bridge simulator learning in nautical cadet training. The study employed a design and development approach at the model-construction stage. The model was developed through literature synthesis covering experiential learning, reflective practice, simulation-based education, formative feedback, and maritime bridge resource management. The resulting model, named BRI-DAR (Benchmarking, Reaction, Inquiry, Decision Analysis, Action Reconstruction, and Reflective Transfer), consists of six debriefing phases supported by instructor prompts, cadet reflection sheets, scenario evidence, and a rubric for assessing reflective quality. The model integrates three learning orientations: technical reconstruction of navigational actions, non-technical analysis of communication and situational awareness, and transfer planning for future watchkeeping readiness. The article contributes a practical debriefing syntax, role distribution between instructor and cadets, an implementation flow for bridge simulator sessions, and assessment instruments that can be used in later empirical validation. The model is therefore presented as a design-stage framework, not as evidence of effectiveness; later studies still need to examine its effect on cadet performance, reflective competence, and situational awareness.

Keywords

Bridge Simulator; Reflective Debriefing; Nautical Cadets; Maritime Vocational Education; Formative Feedback



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Introduction

In maritime vocational education, simulation-based training serves as a bridge between navigational theory and practical work aboard ships. For nautical cadets, mastery of collision-prevention regulations, navigational equipment, and communication procedures alone is insufficient; they must also interpret situations, monitor risks, allocate tasks, and make decisions under time pressure. Bridge simulators are strategically valuable because they can present scenarios that would be difficult, costly, or risky to practise directly aboard a ship (Cook et al., 2011; Issenberg et al., 2005; McGaghie et al., 2011; Ziv et al., 2003). In a simulator, instructors can configure traffic, weather, visibility, equipment failures, and communication conditions to approximate the dynamics of real work (Hays & Singer, 1989).

The pedagogical value of a simulator, however, is determined less by the sophistication of the equipment than by how the experience is revisited as learning material. The simulation-based education literature cautions that practice without debriefing may remain an engaging but superficial technical activity (Fanning & Gaba, 2007; Lederman, 1992; Sawyer et al., 2016). Participants may complete a scenario without understanding why a decision was appropriate, why team communication failed, or how a minor error developed into a navigational risk. Debriefing should therefore be central to simulator learning, rather than merely a brief comment after an exercise (Crookall, 2010; Rudolph et al., 2008).

In bridge simulator training, the need for debriefing is particularly strong because the competencies being developed extend beyond technical skills. Bridge Resource Management requires team coordination, communication, workload allocation, situational awareness, leadership, and decision-making (Barnett et al., 2006; Flin et al., 2008; International Maritime Organization, 2002). These aspects are often not visible in the final scenario score. Cadets may reach the intended waypoint, yet the process may involve unclear communication, weak radar monitoring, or delayed detection of collision risks. Without reflective discussion, instructors may find it difficult to distinguish procedural success from more comprehensive professional readiness.

This situation is relevant to shipping polytechnics and other maritime vocational education institutions in Indonesia. Bridge simulators are already used in various forms of navigational training, but an explicit, documented, and easily

replicable debriefing model is not always available. In many learning practices, debriefing still depends on the instructor's individual style. Some instructors emphasize technical errors, some offer general comments, and others end the session immediately after the scenario because of time constraints. Such variation is understandable, but it can create inconsistencies in learning quality across classes (Dieckmann et al., 2012; Emad & Roth, 2008).

This article responds to the need to design a reflective debriefing model specifically for bridge simulator learning in nautical cadet training. The proposed model does not claim to have improved cadet performance because this stage focuses on design construction. Its main contribution is a model framework, implementation syntax, instructor and cadet roles, reflection instruments, and an assessment rubric as a basis for implementation and empirical validation in future research.

The research question is: how can a reflective debriefing model be designed to suit the characteristics of bridge simulator learning in nautical cadet training? This study aims to produce a reflective debriefing model that integrates experiential learning, reflective practice, formative feedback, simulation-based education, and watchkeeping competency requirements. Accordingly, the article is positioned as model-development research at the conceptual-operational stage.

Methods

This study uses a design and development research approach and is limited to the model-construction stage. Its focus is not on testing effectiveness but on designing a reflective debriefing model that is ready for use and validation in a subsequent stage. This approach was selected because the article aims to produce a conceptual-operational artefact consisting of debriefing syntax, implementation roles, reflection instruments, and an assessment rubric.

The model was developed through literature synthesis and adaptation to the bridge simulator learning context. The literature synthesized covered experiential learning, reflective practice, simulation debriefing, formative feedback, situational awareness, team training, and maritime vocational education (Endsley, 1995; Kolb, 1984; Salas et al., 2008; Schön, 1983; Sellberg, 2018). The synthesis was then translated into a model structure specifying its name, phases, objectives, activities, outputs, and supporting instruments.

The development object in this article is a reflective debriefing model for bridge simulator sessions in nautical cadet training. The model is designed for use after simulator scenarios such as crossing situations, overtaking, restricted visibility, traffic

separation schemes, pilotage, port approaches, or emergency responses. It is not limited to a particular simulator type, provided that the session includes scenario data, cadet roles, learning objectives, and an opportunity for post-simulation discussion.

The development procedure consisted of five steps. First, learning problems in simulator debriefing were identified, particularly the lack of an explicit and easily replicable reflection structure. Second, relevant foundational theories were mapped. Third, the model components and implementation syntax were developed. Fourth, supporting instruments—including reflection prompts, observation sheets, and a rubric—were prepared. Fifth, internal alignment among objectives, activities, evidence, and learning outputs was examined (Biggs & Tang, 2011; Wiggins & McTighe, 2005).

Table 1. Procedure for Developing the Reflective Debriefing Model

Tahap	Activity	Source/Basis	Output
Analisis kebutuhan konseptual	Mengidentifikasi masalah debriefing yang tidak terstruktur	Praktik pembelajaran simulator dan literatur debriefing	Model requirements
Theory synthesis	Menghubungkan experiential learning, reflective practice, feedback, dan situational awareness	Kolb (1984); Schön (1983); Dewey (1933); Endsley (1995); Fanning & Gaba (2007)	Design principles
Syntax construction	Menyusun fase BRI-DAR dan urutan aktivitas	Simulation-based education dan BRM	Model syntax
Instrument development	Membuat prompt, lembar refleksi, observasi, dan rubrik	Assessment for learning dan reflective assessment	Supporting instruments
Coherence review	Mengecek kesesuaian tujuan, aktivitas, bukti, dan output	Internal design alignment	Model ready for empirical validation

This article does not report an effectiveness test involving cadets, present increases in

performance scores, or claim changes in competence. The resulting model remains at the design stage. Expert validation, readability testing of the instruments, a limited trial, and testing of its impact on simulator performance should be conducted in subsequent research. This limitation is stated to ensure that the article's claims remain proportionate and do not exceed the available data.

Results and Discussion

4.1 Rationale for the BRI-DAR Model

The design process produced the BRI-DAR model. BRI-DAR is an acronym for six debriefing phases: Benchmarking, Reaction, Inquiry, Decision Analysis, Action Reconstruction, and Reflective Transfer. The model was designed to address two common weaknesses in simulator debriefing. The first is debriefing that focuses too heavily on technical errors, leading cadets to receive corrections without understanding their own thinking processes. The second is discussion that remains too general and fails to produce a specific improvement plan. The first phase is deliberately called Benchmarking rather than Briefing to distinguish it from the pre-briefing conducted before the scenario. Pre-briefing prepares cadets to run the scenario, whereas Benchmarking opens the debriefing by reconnecting the objectives and performance standards established during pre-briefing to the experience that has just occurred, while also agreeing on discussion rules (Rudolph et al., 2006; Sawyer et al., 2016).

BRI-DAR positions debriefing as a reflective cycle. The initial phase establishes standards and evidence, the middle phases examine experiences and decisions, and the final phase turns the analysis into an action plan. With this structure, a simulator session does not stop at the labels "success" or "failure" but moves toward understanding the relationship among information, decisions, actions, consequences, and improvement (Gibbs, 1988; Kolb, 1984).

Table 2. Syntax of the BRI-DAR Model

Phase	Objective	Key Activities	Instructor's Role	Cadet Output
B - Benchmarking	Menetapkan tolok ukur refleksi dan aturan diskusi	Mengingatkan kembali tujuan dan indikator performa dari pre-briefing, lalu	Menetapkan iklim aman dan fokus pembelajaran	Mengetahui standar yang menjadi pembanding pengalaman skenario

		menyepakati data skenario yang akan dipakai sebagai bukti		
R - Reaction	Melepas respons awal setelah simulasi	Taruna menyampaikan kesan, tekanan, kebingungan, dan persepsi awal	Mendengar tanpa menghakimi dan mengarahkan emosi ke analisis	Mengungkap pengalaman awal secara terbuka
I - Inquiry	Menggali kronologi dan bukti tindakan	Menelusuri apa yang terjadi berdasarkan log, replay, atau catatan observasi	Mengajukan pertanyaan terbuka berbasis bukti	Merekonstruksi alur kejadian
D - Decision Analysis	Menganalisis keputusan teknis dan non-teknis	Membahas data yang tersedia, alternatif tindakan, komunikasi, dan SA	Menghubungkan tindakan dengan prinsip navigasi/BRM	Menjelaskan alasan, risiko, dan alternatif keputusan
A - Action Reconstruction	Merumuskan tindakan yang lebih tepat	Taruna menyusun ulang respons ideal untuk titik kritis skenario	Memberi umpan balik formatif dan contoh standar	Menyusun tindakan korektif yang spesifik
R - Reflective Transfer	Mentransfer pembelajaran ke tugas jaga	Taruna menulis pelajaran utama, rencana	Menutup dengan komitmen belajar dan	Membuat rencana aksi individual/tim

	berikutnya	perbaikan, dan indikator keberhasilan	tindak lanjut	
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4.2 Model Components

The BRI-DAR model contains five main components: learning objectives, simulator scenario, performance evidence, reflective dialogue, and a transfer plan. Learning objectives determine the focus of the debriefing. In a bridge simulator, objectives may include maintaining situational awareness, applying COLREG, establishing bridge-team communication, or taking safe action in dense traffic.

The simulator scenario provides the foundational experience to be analysed. For debriefing to be effective, the scenario should contain clearly defined critical points. A critical point is a moment when cadets must make an important decision, such as altering course, making a VHF call, determining safe speed, or allocating monitoring tasks. These moments form the main material for analysis (Oser et al., 1999).

Performance evidence consists of data that keep the discussion objective. Evidence may include instructor notes, simulator replays, vessel tracks, communication logs, reaction times, CPA/TCPA, or observation checklists. Such evidence is important because debriefing based only on participants' memories can easily become self-justification or subjective judgment.

Reflective dialogue is the core of the model. The instructor uses questions to help cadets trace the relationships among perception, decisions, actions, and consequences. The transfer plan ensures that learning does not stop with the completed scenario but carries over to subsequent exercises, sea practice, or actual watchkeeping duties (Bandura, 1997; Zimmerman, 2002).

Table 3. Components and Functions of the BRI-DAR Model

Component	Function	Contoh dalam <i>Bridge simulator</i>	Product
Tujuan pembelajaran	Determining the direction of debriefing	Menerapkan COLREG pada crossing situation	Performance indicators
Skenario simulator	Providing a concrete experience	Restricted visibility dengan beberapa target radar	Training event

Bukti performa	Maintaining objectivity in discussion	Track, CPA/TCPA, voice log, checklist observasi	Analysis data
Dialog reflektif	Menghubungkan tindakan dan alasan	Pertanyaan tentang alasan alteration of course	Understanding the process
Rencana transfer	Mengubah refleksi menjadi tindak lanjut	Komitmen monitoring radar setiap interval tertentu	Action plan

4.3 Principles for Conducting Reflective Debriefing

Evidence-based: discussions must refer to data from the scenario, rather than relying solely on the instructor's general assessment. Psychologically safe: trainees need to feel that mistakes are analyzed as learning opportunities, not as grounds for humiliation (Rudolph et al., 2006). Question-oriented: instructors guide participants through reflective questioning before offering direct corrections. Balanced between technical and non-technical aspects: debriefing covers both operational tasks—such as navigation—and non-technical skills, including communication, coordination, workload management, and situational awareness. Promotes transfer: every session should conclude with an action plan that can be applied to future training exercises.

4.4 Implementation Flow in a Bridge Simulator Session

The BRI-DAR model is designed to fit into the learning cycle commonly used in bridge simulator training. A session can be divided into four parts: pre-briefing, scenario execution, BRI-DAR debriefing, and follow-up. The time allocation can be adjusted to the scenario's complexity, but sufficient time should still be reserved for debriefing. For a 60-minute scenario, for example, allocating 20–30 minutes for debriefing is reasonable because reflective learning occurs when the simulation experience is processed (Fanning & Gaba, 2007; Sellberg, 2018).

Table 4. Example Time Allocation for a BRI-DAR-Based Simulator Session

Session Component	Estimated Time	Activity	Management Notes
Pre-briefing	10-15 menit	Menjelaskan tujuan, peran,	Mencegah kebingungan

		aturan komunikasi, dan standar performa	peran saat skenario berjalan
Pelaksanaan skenario	30-60 menit	Taruna menjalankan tugas jaga dan instruktur mengamati titik kritis	Data performa dicatat untuk debriefing
Debriefing BRI-DAR	20-30 menit	Melaksanakan enam fase BRI-DAR	Fokus pada 2-3 titik kritis utama
Tindak lanjut	5-10 menit	Taruna menulis rencana perbaikan dan target latihan berikutnya	Dapat masuk portofolio pembelajaran

4.5 Reflective Prompts for Nautical Cadets

Reflective prompts are needed to ensure that discussion does not stop at “what went wrong.” The following prompts are designed to help cadets examine their experience from a descriptive level toward analysis and transfer (Moon, 2004). Instructors do not need to use every question in a single session. The prompts selected should match the critical points in the scenario.

Table 5. Examples of BRI-DAR Reflective Prompts

Phase	Prompts for Cadets	Reflective Function
Reaction	Bagian mana dari skenario yang paling menekan atau membingungkan?	Identifying initial experiences
Inquiry	Informasi apa yang Anda lihat pada radar/ECDIS/visual sebelum mengambil keputusan?	Tracing situational perception
Decision Analysis	Mengapa tindakan itu dipilih dibanding alternatif lain?	Exploring the basis for the decision

Decision Analysis	Apakah komunikasi antaranggota bridge team sudah eksplisit dan tertutup-loop?	Analyzing non-technical skills
Action Reconstruction	Jika skenario diulang, tindakan apa yang akan Anda ubah?	Formulating corrections
Reflective Transfer	Pelajaran apa yang harus Anda bawa ke tugas jaga berikutnya?	Building learning transfer

4.6 Rubric for Assessing Reflection Quality

The following rubric is not intended to punish cadets but to map the quality of their reflection (Moon, 2004). Scores can be used formatively to help cadets identify aspects of reflection that need strengthening. Four dimensions are used: event description, decision analysis, non-technical awareness, and action transfer.

Table 6. Rubric for Cadets' Reflection Quality After Simulation

Dimensi	1 – Low	2 – Adequate	3 – Good	4 – Excellent
Deskripsi kejadian	Menyebut kejadian secara umum tanpa urutan jelas	Menjelaskan sebagian kronologi	Menjelaskan kronologi dengan titik kritis	Menjelaskan kronologi lengkap berbasis bukti skenario
Analisis keputusan	Tidak menjelaskan alasan keputusan	Provides only a general rationale	Menghubungkan keputusan dengan informasi yang tersedia	Membandingkan alternatif keputusan dan konsekuensinya
Kesadaran non-teknis	Tidak menyinggung komunikasi/tim	Menyebut aspek tim secara umum	Mengidentifikasi masalah komunikasi/SA/workload	Menganalisis hubungan non-teknis dengan risiko navigasi
Transfer tindakan	Tidak ada rencana perbaikan	The plan remains general	Rencana spesifik untuk latihan berikutnya	Rencana spesifik, terukur, dan

				dikaitkan dengan tugas jaga nyata
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4.7 Roles of the Instructor, Cadets, and Simulator Operator

Implementing the model requires a clear division of roles. The instructor acts as a facilitator of reflection, not merely as an evaluator (Dismukes & Smith, 2000; Vygotsky, 1978). The instructor selects critical points, organizes the discussion sequence, maintains a safe climate, and provides formative feedback. Cadets act as analysts. They do not merely answer the instructor's questions; they reconstruct actions, identify alternatives, and write a transfer plan. The simulator operator supports the provision of performance evidence, such as replays, tracks, and technical scenario records.

In large classes, debriefing can be conducted at two levels. The first is a small-team debriefing for participants who held active roles on the bridge team. The second is a plenary debriefing that emphasizes general principles and learning transfer. This strategy helps maintain time efficiency without reducing the depth of reflection (Salas et al., 2008).

4.8 Contributions to Vocational Learning Management

The BRI-DAR model contributes to vocational learning management in three ways. First, it standardizes the debriefing process, helping study programs ensure that every simulator session produces not only practical experience but also a traceable reflection process. Second, it creates learning documentation through reflection sheets and action plans. This documentation can become part of the cadets' competency portfolios. Third, it strengthens formative assessment because instructors obtain evidence of how cadets think, rather than only the final scenario outcome (Rudolph et al., 2008).

From a programme-management perspective, the model also enables integration among the curriculum, scenarios, rubrics, and follow-up activities. Study programmes can map simulator scenarios to learning outcomes, use the same rubric across classes, and collect reflection data to improve learning. Debriefing thus becomes not an informal activity entirely dependent on instructor preference, but part of the simulator learning quality system (Biggs & Tang, 2011).

4.9 Conceptual Comparison with Conventional Debriefing

Table 7. Comparison of Conventional Debriefing and BRI-DAR

Aspect	Conventional Debriefing	BRI-DAR
Fokus	Koreksi kesalahan dan penilaian umum	Refleksi berbasis bukti, analisis keputusan, dan transfer
Peran instruktur	Primary provider of comments	Fasilitator pertanyaan dan umpan balik formatif
Peran taruna	Recipient of corrections	Penganalisis pengalaman dan penyusun rencana aksi
Bukti performa	Sering berdasarkan ingatan atau observasi umum	Menggunakan log, replay, track, dan checklist
Output	Oral conclusion	Lembar refleksi, action plan, dan portofolio pembelajaran

4.10 Model Limitations and Validation Agenda

The main limitation of this article is the absence of empirical validation. The model remains at the design stage. The next stage should therefore include content validation by navigation experts, learning-technology experts, and simulator instructors; readability testing of the reflection sheet with cadets; a limited trial using one or two scenarios; and an examination of the relationship between reflection quality and simulator performance. Future research could also compare classes using BRI-DAR debriefing with classes using conventional debriefing, but such a design requires ethical procedures, validated instruments, and actual field data (AERA et al., 2014).

Conclusion

This article presents the BRI-DAR model as a design for reflective debriefing in bridge simulator learning for nautical cadet training. The model consists of six phases: Benchmarking, Reaction, Inquiry, Decision Analysis, Action Reconstruction, and Reflective Transfer. Each phase has a clear objective, activity, instructor role, and learning output. The model is designed to help cadets transform simulator

experience into technical understanding, non-technical awareness, and a transfer plan for subsequent watchkeeping duties.

The article's practical contributions lie in its implementation syntax, reflective prompts, reflection-quality rubric, and implementation flow for simulator instructors. Its theoretical contribution is the integration of experiential learning, reflective practice, formative feedback, situational awareness, and bridge resource management into a single debriefing model tailored to maritime vocational education. Because this article is at the model-design stage, no claims of effectiveness are made. Expert validation and empirical testing with cadets are needed in future research.

References

- AERA, APA, & NCME. (2014). Standards for educational and psychological testing. American Educational Research Association.
- Argyris, C., & Schön, D. A. (1978). Organizational learning: A theory of action perspective. Addison-Wesley.
- Bandura, A. (1997). Self-efficacy: The exercise of control. W. H. Freeman.
- Barnett, M., Gatfield, D., & Pekcan, C. (2006). Non-technical skills: The vital ingredient in world maritime technology? In Proceedings of the International Conference on World Maritime Technology. Institute of Marine Engineering, Science and Technology.
- Biggs, J., & Tang, C. (2011). Teaching for quality learning at university (4th ed.). Open University Press.
- Boud, D., Keogh, R., & Walker, D. (1985). Reflection: Turning experience into learning. Kogan Page.
- Boud, D., & Molloy, E. (2013). Feedback in higher and professional education: Understanding it and doing it well. Routledge.
- Brookfield, S. D. (2017). Becoming a critically reflective teacher (2nd ed.). Jossey-Bass.
- Cook, D. A., Hatala, R., Brydges, R., Zendejas, B., Szostek, J. H., Wang, A. T., Erwin, P. J., & Hamstra, S. J. (2011). Technology-enhanced simulation for health professions education: A systematic review and meta-analysis. *JAMA*, 306(9), 978-988.
- Crookall, D. (2010). Serious games, debriefing, and simulation/gaming as a discipline. *Simulation & Gaming*, 41(6), 898-920.

- Dewey, J. (1933). *How we think: A restatement of the relation of reflective thinking to the educative process*. D. C. Heath.
- Dieckmann, P., Østergaard, D., Lippert, A., & Friis, S. M. (2012). Goals, success factors, and barriers for simulation-based learning: A qualitative interview study in health care. *Simulation & Gaming*, 43(5), 627-647. <https://doi.org/10.1177/1046878112439649>
- Dismukes, R. K., & Smith, G. M. (2000). *Facilitation and debriefing in aviation training and operations*. Ashgate.
- Emad, G., & Roth, W. M. (2008). Contradictions in the practices of training for and assessment of competency: A case study from the maritime domain. *Education + Training*, 50(3), 260-272.
- Endsley, M. R. (1995). Toward a theory of situation awareness in dynamic systems. *Human Factors*, 37(1), 32-64.
- Ericsson, K. A. (2008). Deliberate practice and acquisition of expert performance: A general overview. *Academic Emergency Medicine*, 15(11), 988-994.
- Fanning, R. M., & Gaba, D. M. (2007). The role of debriefing in simulation-based learning. *Simulation in Healthcare*, 2(2), 115-125.
- Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. *American Psychologist*, 34(10), 906-911.
- Flin, R., O'Connor, P., & Crichton, M. (2008). *Safety at the sharp end: A guide to non-technical skills*. Ashgate.
- Gibbs, G. (1988). *Learning by doing: A guide to teaching and learning methods*. Further Education Unit, Oxford Polytechnic.
- Gredler, M. E. (1996). Educational games and simulations: A technology in search of a research paradigm. In D. H. Jonassen (Ed.), *Handbook of research for educational communications and technology* (pp. 521-540). Macmillan.
- Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, 77(1), 81-112.
- Hays, R. T., & Singer, M. J. (1989). *Simulation fidelity in training system design*. Springer.
- International Maritime Organization. (2002). *Model Course 1.22: Ship simulator and bridge teamwork*. IMO Publishing.
- International Maritime Organization. (2017). *International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW)*, including

- 2010 Manila Amendments. IMO Publishing.
- Issenberg, S. B., McGaghie, W. C., Petrusa, E. R., Gordon, D. L., & Scalese, R. J. (2005). Features and uses of high-fidelity medical simulations that lead to effective learning. *Medical Teacher*, 27(1), 10-28.
- Kayes, D. C. (2002). Experiential learning and its critics: Preserving the role of experience in management learning and education. *Academy of Management Learning & Education*, 1(2), 137-149.
- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Prentice Hall.
- Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge University Press.
- Lederman, L. C. (1992). Debriefing: Toward a systematic assessment of theory and practice. *Simulation & Gaming*, 23(2), 145-160.
- Mallam, S. C., Nazir, S., & Renganayagalu, S. K. (2019). Rethinking maritime education, training, and operations in the digital era: Applications for emerging immersive technologies. *Journal of Marine Science and Engineering*, 7(12), 428.
- Mann, K., Gordon, J., & MacLeod, A. (2009). Reflection and reflective practice in health professions education: A systematic review. *Advances in Health Sciences Education*, 14(4), 595-621.
- McGaghie, W. C., Issenberg, S. B., Cohen, E. R., Barsuk, J. H., & Wayne, D. B. (2011). Does simulation-based medical education with deliberate practice yield better results than traditional clinical education? A meta-analytic comparative review of the evidence. *Academic Medicine*, 86(6), 706-711.
- Mezirow, J. (1991). *Transformative dimensions of adult learning*. Jossey-Bass.
- Moon, J. A. (2004). *A handbook of reflective and experiential learning: Theory and practice*. RoutledgeFalmer.
- Orasanu, J., & Fischer, U. (1997). Finding decisions in natural environments: The view from the cockpit. In C. E. Zsombok & G. Klein (Eds.), *Naturalistic decision making* (pp. 343-357). Lawrence Erlbaum.
- Oser, R. L., Gualtieri, J. W., Cannon-Bowers, J. A., & Salas, E. (1999). Training team problem solving skills: An event-based approach. *Computers in Human Behavior*, 15(3-4), 441-462.
- Rudolph, J. W., Simon, R., Dufresne, R. L., & Raemer, D. B. (2006). There's no such thing as "nonjudgmental" debriefing: A theory and method for debriefing with

- good judgment. *Simulation in Healthcare*, 1(1), 49-55.
- Rudolph, J. W., Simon, R., Raemer, D. B., & Eppich, W. J. (2008). Debriefing as formative assessment: Closing performance gaps in medical education. *Academic Emergency Medicine*, 15(11), 1010-1016.
- Salas, E., Bowers, C. A., & Edens, E. (Eds.). (2001). *Improving teamwork in organizations: Applications of resource management training*. Lawrence Erlbaum.
- Salas, E., DiazGranados, D., Klein, C., Burke, C. S., Stagl, K. C., Goodwin, G. F., & Halpin, S. M. (2008). Does team training improve team performance? A meta-analysis. *Human Factors*, 50(6), 903-933.
- Sawyer, T., Eppich, W., Brett-Fleegler, M., Grant, V., & Cheng, A. (2016). More than one way to debrief: A critical review of healthcare simulation debriefing methods. *Simulation in Healthcare*, 11(3), 209-217.
- Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*. Basic Books.
- Sellberg, C. (2018). From briefing, through scenario, to debriefing: The maritime instructor's work during simulator-based training. *Cognition, Technology & Work*, 20(1), 49-62.
- van Merriënboer, J. J. G., & Kirschner, P. A. (2018). *Ten steps to complex learning* (3rd ed.). Routledge.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
- Wiggins, G., & McTighe, J. (2005). *Understanding by design* (2nd ed.). ASCD.
- Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory Into Practice*, 41(2), 64-70.
- Ziv, A., Wolpe, P. R., Small, S. D., & Glick, S. (2003). Simulation-based medical education: An ethical imperative. *Academic Medicine*, 78(8), 783-788.