

Title: **Informal learning: relevance and application to healthcare simulation**

Clinical Simulation in Nursing

Dr M.A. Kelly

Senior Lecturer; Director – Simulation and Technologies

Faculty of Health, University of Technology, Sydney

Emeritus Professor P. Hager

Faculty of Arts and Social Sciences, University of Technology, Sydney

Key words

→ Informal learning

→ Healthcare simulations

→ Experiential learning

→ Implicit learning

→ Tacit learning

3 bullet points

- There is strong applicability of informal learning for healthcare simulations.
- The design and implementation of simulations should arouse student enthusiasm, interest and motivation.
- Much valuable informal learning is significantly tacit and whole-person, embodied learning.

Introduction

The concepts of formal learning (such as lectures, assessments) are familiar and constitute what are perceived to be the mainstay of education systems and processes. However the notion of informal learning and its contribution to wisdom, judgement and community has regained prominence in the educational literature as a valuable component of holistic learning, particularly for practice (see, e.g., Beckett & Hager 2002, Hager & Halliday 2006). There are strong connections and applicability of the characteristics of informal learning for healthcare simulations, specifically in fostering values and professional behaviours, which is the focus of discussion within this paper. To illustrate these connections, a case study from a recently completed doctoral thesis will be featured. Consideration of informal learning, in addition to the more formalised aspects of planning and delivering healthcare simulations, may inform and extend awareness of contemporary pedagogies for educators and clinicians.

Overview of informal learning theory

‘Informal learning’ is a concept that has had a relatively low profile. Hager and Halliday (2006, p. 29) suggest that this is so because, as the adjective ‘informal’ implies, informal learning is usually defined by the particular characteristics that it lacks in relation to its more illustrious sibling ‘formal learning’. As Hager and Halliday (2006, p. 29) note three essential features are usually required for an instance of learning to count as formal. They are that it:

- (i) Involves a specified curriculum,
- (ii) Is taught by a designated teacher or group of teachers,
- (iii) Involves the learning attained by individual learners being suitably assessed and certified.

Thus formal learning can be characterised as a planned activity that takes place in accredited educational institutions such as schools, colleges, universities, training centres, and the like. Typically formal learning follows a prescribed sequence whether or not actual attendance of the learners at the institution is a requirement. Often quite specific outcomes are required to be achieved, though sometimes the learning sequence reflects broader directions or aims. However, in all instances of formal learning, learners have a general idea of what they are supposed to be learning and they accept that the prescribed learning has been decided by appropriate authorities (Hager & Halliday, 2006, pp. 1-2).

If we reserve the term formal learning for cases that meet each of these three criteria, it is clear that there will be some borderline cases of learning that exhibit some degree of formality, by matching only two or one of these criteria. Such borderline cases are sometimes called 'non-formal' learning. Examples would be hobby or craft courses that follow an introductory curriculum delivered by experienced enthusiasts, but which involve no formal assessment of student learning. But one of the most solid findings of educational research is that 'assessment drives the learning' (e.g. Hayward 2012), that is, students take more seriously learning on which they expect to be assessed, whilst downplaying non-assessable learning. In the absence of formal assessment, these non-formal hobby and craft courses have to rely on participant motivation and enthusiasm to drive the learning.

Given these characterisations of formal and non-formal learning, it could be said that informal learning encompasses all other situations in which people learn. This would mean, of course, that a wide and very diverse range of instances of learning fall into the category of informal learning. Learning from life experiences of all kinds, whether at work or in leisure activities, is obviously a very large part of the overall realm of informal learning. Of course, participation in formal education activities is a major part of many peoples' life experiences. Typically, a quantum of informal learning is gained in addition to the formal learning. Thus, the learning that teachers and lecturers plan for their students will often be accompanied by unplanned learning. Part of quality formal education arrangements is to foster an ethos that encourages informal learning of a kind that complements and augments the planned formal learning. A central claim of this paper is that an important consideration when designing and implementing simulation learning activities is how to maximise the value of the informal learning that will, inevitably, occur alongside of the planned formal learning outcomes. Illich famously called this informal learning, that occurs alongside of formal learning, the 'hidden curriculum' (Illich, 2000).

But so far informal learning has been considered in terms of what it lacks in relation to its higher profile siblings formal and non-formal learning. Can it be described more positively? Yes, it can.

Key features of informal learning

As discussed at length in Hager and Halliday (2006), key features of informal learning are that it is *indeterminate*, *opportunistic*, involves *internal and external goods*, and is an *ongoing process* as described below.

1. Indeterminate

In contrast to formal learning outcomes that often can be minutely pre-specified, informal learning is much less determinate than this for many reasons. Firstly, informal learning is significantly contextual, in that its content is significantly shaped by the particularities of the context in which it occurs (Hager & Halliday, Chapter 6). As well, learners themselves are part of the context, thereby adding to the uniqueness of the particular learning situation. Secondly, the context is often one of unfolding events. So informal learning is here often connected with making appropriate judgements about how best to proceed in a continually evolving process, one in which participants are required to constantly monitor and perhaps revise their short term goals (Hager & Halliday, Chapter 8). This is a crucial dimension of indeterminacy of informal learning. Finally, much valuable informal learning is significantly tacit (Eraut, 2000). It is the whole-person, embodied learning, including affective dimensions that cannot be fully captured in a set of curriculum statements. Thus important aspects of informal learning are indeterminate in that they are not specifiable in advance.

Undoubtedly, healthcare simulations exemplify multidimensional and fluid evolving processes in which participants are encouraged to make holistic professional judgements. Whilst formal learning objectives for a simulation can be specified in advance, some of these will necessarily be at a relatively general level. Some of the specifics of the learning will be indeterminate in advance because they will depend significantly on variable contextual factors such as the individual actors backgrounds , experience and how they respond to unfolding events. Thus the formal aspects of how the simulation learning situation is designed and delivered will be accompanied by various informal aspects.

2. Opportunistic

Much valuable informal learning is opportunistic and contingent, both at the individual and communal levels. Because informal learning situations are typically indeterminate, they continually throw up unanticipated new learning opportunities. For instance, mistakes typically provide occasions for productive learning. Hager and Halliday (2006) provide numerous examples of the opportunistic aspects of informal learning illustrated through case studies of people who have navigated through life and work experiences to achieve fulfillment irrespective of their level of formal qualification. Clearly, those responsible for healthcare simulations need to also view these opportunistic activities as important sources of unplanned and unanticipated learning opportunities.

3. *Involves both internal and external goods*

As Hager and Halliday (2006) demonstrate, rich examples of informal learning feature both internal and external goods. Traditionally, mainstream disciplines have centred on internal goods (i.e. knowledge and dispositions that are worth cultivating for their own sake). Many well-known definitions of education centre on this feature of learning (e.g. Peters 1965). In contrast, external goods are those goods which have instrumental or market value. In recent decades, neo-liberal policy agendas have served to shift educational concerns towards the marketisation of pre-specified products, i.e. external goods, and away from less tangible internal goods such as knowledge and dispositions that are valuable in themselves. Yet the numerous case studies in Hager and Halliday (2006) demonstrate that informal learning is enhanced in situations that emphasise both internal (values; behaviours) and external goods (skills competency; assessment grades). Clearly, this balance should be a feature of all well-planned and presented simulations as either preparation for practice or as continuing professional development.

4. *Learning as an ongoing process*

It was noted above that part of the indeterminacy of informal learning flows from its occurrence within continually evolving processes. In fact, informal learning itself is most helpfully viewed as a continually evolving process rather than as a series of completed learning events. Thus, informal learning is best understood as an *ongoing process of becoming* by the learner, rather than as them attaining a particular state in preparation for something else. Thus, the significance of well-planned and presented simulations in undergraduate courses does not stop there. Rather ideally the learning from these simulations, both informal and, perhaps, formal, will be further refined and consolidated as learners engage in professional practice following graduation. Reflection on practice and recollection of (simulation) learning experiences for subsequent clinical scenarios are desired, ongoing processes and a feature of contemporary research in the field. Similarly for practicing clinicians, ensuring effective teamwork, communication and development of leadership qualities within representative clinical scenarios would assist with extending the scope and level of practice.

Relevance and application of informal learning theory within healthcare simulation

More and more, teaching is for surviving in a testing regime rather than for engagement with a discipline. Because internal goods are closely connected with whole person *know how* and *the tacit*, they

have been increasingly neglected as the focus has shifted to formal learning and assessment. So, much of the present educational climate is simply not conducive to the internal goods that are central to rich informal learning, as well as to learning in general. This is why, perhaps unknowingly, healthcare simulations are received as engaging and powerful learning experiences through predominantly formative approaches. Contemporary healthcare simulations frequently facilitate learning as *becoming* rather than learning as *a thing or commodity*.

The relevance and application of informal learning for simulation will be illustrated within the context of undergraduate nursing curricula, which affords a level of applicability for other health disciplines and for continuing professional development programs. To begin, the features of informal learning contrast with those which comprise formal learning, that there is a **specified curricula**; content is **taught by designated teachers**, and the **learner is assessed or certified** in some way. Similarities – and distinct differences – are inherent within contemporary healthcare simulation practices with regard to formal and informal learning as described in this paper. The discussion continues below and is summarised in Figure 1 for reference.

Acknowledging recommended practices (Arthur, Levett-Jones, & Kable, 2013; Gaba, 2007; Jeffries, 2007), simulations for nursing students are often *integrated within existing curricula* rather than comprising a specified curricula per se (Howard, Englert, Kameg, & Perozzi, 2011; Sinclair & Ferguson, 2009). Assisting healthcare novices to make connections between theory and practice is key at this stage of learning hence complementing theory with contextual instances of practice through simulation is the ideal (Disler, Rochester, Kelly, White, & Forber, 2013). Experienced clinicians on the other hand may indeed achieve greater benefit from undertaking a *specific and focused simulation curricula* drawing and building on their repertoire of practices. Whatever the case, the purpose of the simulation activities should always be to complement theoretical knowledge and extend the learner's understanding of and connection with practice. Lessons from the early forays into healthcare simulation have led to general acceptance of integrating simulation across curricula rather than using an 'add on' approach.

Instead of didactic delivery of content, learning through simulation is generally *facilitated* by a *designated teacher* or more commonly, *two or more educators or clinicians*. Rather than listening to lectures which may lack context for the student and have minimal impact on learning, this approach enables simulation participants to actively engage in learning and discussion. Delivered in this manner, simulations become learner-focused rather than being solely based on what information the teacher believes is important to impart to students. Although participants may be aware of the predetermined

learning objectives and what they are *expected* to learn, benefits extend beyond these features within simulation encounters.

Rather than learning occurring only at an individual level, contemporary simulations facilitate peer learning, within a group or team scenario and when observing others. This advantage is because *assessment or certification* of individual learning is not always the primary intent of simulations, particularly when such activities are designed as formative learning experiences. This contrasts with the earlier comment and general belief that for students, 'assessment drives learning'. The unique benefits of simulations often reported by participants are the level of engagement and enjoyment with such activities, yet assessment or certification is most often not a driver for learning in these instances. In contrast, simulation is also used for summative assessment such as CPR performance, as annual certification for practice. In this case assessment and certification would primarily drive learning and refinement of requisite skills, but with different outcomes.

What is becoming increasingly apparent are the ongoing benefits and impact of the learning, enabled through simulation and reflection, for subsequent practice. Feedback from students is often that simulation 'glue things together', it helps them draw on tacit knowledge and move from *knowing* to *knowing how* (Kelly, Forber, Conlon, Roche, & Stasa, 2014). In essence the additional opportunities afforded through simulation for informal learning contributes to the process of *becoming* a practitioner (Kelly, 2014).

Given that, at best, only limited aspects of simulation learning activities are susceptible to formal assessment, it is up to educators responsible for designing and implementing simulations to ensure that scenarios are presented in ways that arouse student enthusiasm, interest and motivation so as to maximise the many valuable informal learning opportunities that such simulations provide. For practicing clinicians, similar principles apply in that the focus and intent of simulation scenarios should be perceived by the participant as valuable experiences which contribute to workplace activities.

Insert Figure 1 here

Simulation and informal learning - a case study

A case study describing how simulation enabled informal, in addition to formal, learning opportunities for a final year nursing student illustrates the relevance of this framework and the impact on learning for

subsequent professional practice. The research, which the case study is drawn from, investigated how simulations contributed to students' learning, clinical judgement and subsequent clinical practice, and was approved by the university's ethics committee. Data were collected during two semi-structured interviews undertaken by the primary author. Following written consent, the interviews took place in the final week of the 3-year Bachelor of Nursing (BN) degree program and during the early months of new graduate nurse employment. Interviews from nine study participants were audio recorded, transcribed, checked for reliability and analysed using iterative processes (Creswell & Plano Clark, 2011). One finding from the analysis was that simulations enabled informal learning to occur in addition to the planned learning objectives. The concepts of informal learning as: indeterminate, opportunistic, featuring internal and external goods, and an ongoing process will be highlighted within the experiences shared by one participant, given the pseudonym *Benita*.

Benita, a mature-aged female student (47-53 year age group) of Lebanese heritage, brought numerous life and work experiences to the simulation learning activities. She had worked for 15 years in a nursing home as an Assistant in Nursing (AIN), and had previously worked as a legal secretary and in the fashion business. However the impact of the university simulations for *Benita's* subsequent nursing practice were profound and highlight the greater benefits attained beyond the intended formal learning objectives. All of the simulations *Benita* experienced were formative and occurred during the last two years of her degree program. *Benita* participated in three university simulations: a 2nd year paediatric focused scenario and two simulations in her final year, for a medical-surgical subject and an interdisciplinary simulation pilot project with final year medical students.

Indeterminate

Excerpts from *Benita's* account of participating in the interdisciplinary simulation illustrate the indeterminate benefits afforded to her in experiencing two deteriorating patient scenarios. Eight students signed up for a half-day session, four nursing and four medical students. The group were divided into two and while one half participated in a simulation the other four observed the unfolding scenario via real-time audiovisual streamed to an adjacent room. Working in pairs, the nurses commenced interactions with the 'patient'. When the clinical parameters warranted a medical review, the nurses called for the (pair of) doctors. Following a debriefing session, which included observers' opinions, the second group engaged in a similar but contextually different patient scenario. *Benita* happened to observe a simulation before participating in one.

Although these scenarios had planned learning objectives, *Benita* reported additional benefit in two ways - from interacting with her team and responding to the patient situation, and from observing how others managed a similar but somewhat different clinical scenario. How a simulation scenario unfolds is often determined by how the participants respond to events and cues. Following the simulation, *Benita* came to a new realization about the importance of time critical actions, and that **she** was equally capable of initiating and escalating crucial patient care. Although the importance of teamwork and communication are critical in such scenarios (and often stated as learning objectives) the variation in how simulation scenarios unfold and how participants react, means that some of the learning is indeterminate and cannot be fully anticipated.

The second benefit for *Benita* was from watching the live video stream of others undertaking the simulation. , *Benita* likened this to “*watching a game show*” – that she and others were willing the participants to “*look at the drain – he’s losing fluid from the drain*”. Feelings of frustration and increasing anxiety emerged as *Benita* considered the possible patient outcomes from these (in)actions. Although the simulation activities were planned according to set learning objectives, the learning outcomes were quite unique and individual for *Benita*.

In addition to performing in the second scenario, the impact of watching others and discussing alternative clinical responses with peers during the debriefing provided added value in *Benita’s* subsequent practice. *Benita* described these simulation experiences as an epiphany. In the clinical setting she was now mindful of constantly monitoring her own - and other patients – as a continually evolving process; and had revised and reprioritized her short term goals. These examples were not specific simulation learning objectives, rather, the individual and indeterminate benefits which *Benita* reported.

Opportunistic

In a 2nd-year deteriorating patient simulation, one intended learning objective was for students to appreciate intravenous fluid resuscitation regimes appropriate for an elderly woman with co-morbidities. During the first phase of this simulation, *Benita* did not perceive that the rate of intravenous fluid administration was problematic, but rather quite ‘standard’ for a post-operative patient. However, during the second phase the patient showed respiratory signs of fluid overload. Throughout the debriefing discussions there was opportunity to specifically discuss intravenous fluid regimes, based on the observed actions of students during the simulation. Other classes may have discussed different issues, but because fluid therapy issues were discussed in this instance, *Benita* reached a new level of understanding about the consequences of excess intravenous fluids in the context of a patient’s age and co-morbidities. Seeing

how the 'patient' physically responded to this error in clinical management was opportunistic and provided a new awareness for *Benita* of similar situations in clinical practice.

Internal and external goods

The simulation scenarios *Benita* experienced were all formative learning activities. As such, students should be able to demonstrate authentic actions and react as they see fit to the evolving scenario. One attraction of simulation as a learning approach is that connections can be made between knowledge and decision making. But greater value is often realized in how participants' values, tacit knowledge and professional behaviours can be brought to the fore. These are, respectively, examples of the external and internal goods described in earlier sections. An excerpt from *Benita's* interview reflects how the simulation experiences raised her tacit knowledge to the surface and provided connections across the knowledge and practice domains.

Benita: The simulation draws out what you know and what you don't know. I read about things I don't know, work on it, and it prepares you for the next simulation. [But also] intuition and that gut feeling - my experience working with aged care [patients] has helped develop this [clinical judgement]. But the simulation gives you a stepping stone to develop [clinical judgement]. I wouldn't have [known other things] if I hadn't had that simulation no matter how much experience I'd had. The [interdisciplinary] simulation opened up what I did know and what I didn't know - it [tacit knowledge] seems hidden at the back [of my mind] but I was able to bring it out. It was like the penny dropped - before that I was doing my job, I felt okay, I felt confident but that simulation was a whole new beginning for me. It was like a turning point.

Being able to enact the full context of clinical scenarios, facilitated through simulation, offers the opportunity for students to immerse themselves into the registered nurse role. Feeling the pressure to make decisions and work efficiently with others replicates the practice world they are about to enter. Having the opportunity to demonstrate the requisite professional behaviours and examine their inherent values, raises the importance of paying attention to the internal as well as external goods within learning activities and curricula.

Ongoing process – one of becoming

In addition to the “*turning point*” comment, participating in the interdisciplinary simulation was an epiphany for *Benita*, as she was now “*noticing everything*” in subsequent clinical practice. To use her words, “*the penny had dropped*” - and *Benita* was now applying her theoretical knowledge to practice in more meaningful ways. Two accounts which *Benita* shared illustrated how she now *noticed* more things in clinical practice – not just in relation to her own patients but about others she had not been assigned to. These accounts illustrate a level of independent-initiated care and the contribution of the simulations to *Benita becoming* an independent thinker.

The first account occurred as follows. Passing by a room, *Benita* noticed a patient who appeared unwell. She commenced a systematic assessment (blood glucose), gathered targeted physical data (heart rate, blood pressure, mini-mental examination), immediately initiated appropriate responses (returned the patient to bed) and alerted the nurse caring for the patient. *Benita* accurately determined the patient was experiencing a hypoglycaemic event and could quickly become unconscious. The second account also related to a patient not under *Benita’s* care. Upon noticing the patient’s intravenous cannula appeared unkempt, *Benita* determined the cannula had been in place much longer than recommended (72 hours to minimise infection and complications). On suggesting to the respective nurse that the cannula be removed, the action was then carried out. These examples reflect a higher level of knowing and a willingness to act without specific direction, which *Benita* attributed as a result of her simulation experiences. One could question what the patient outcomes may have been if *Benita* had not intervened on these occasions.

The benefits flowed on into *Benita’s* new graduate practice where she now anticipates likely clinical issues of patients on the hospital ward where she works. Creating checklists, *Benita* prepares herself, for example, to be able to discern the range of patients’ chest pain or stroke symptoms and how to immediately respond and escalate requests for patient care. *Benita* stated the triggers for these new awakenings were the simulations she experienced at university. Beyond the intended learning objectives for each simulation it is evident from *Benita’s* accounts that these learning encounters provided unique and unintended benefits for the individual.

Summary

A number of learning theories have been aligned with healthcare simulations but the focus and range of activities associated with contemporary simulations are such that they should also be informed by practice-related frameworks (Boud, 2012). Elements of several learning theories are applicable to healthcare simulations but in general terms this research suggests that these types of learning activities are powerful because they also facilitate opportunities for informal learning (Hager, 2011) which can arouse students' enthusiasm, interest and motivation. Examples of such unintended outcomes have been illustrated through the case study of *Benita*. For practice-based disciplines activities which enable learners to draw on their tacit knowledge and learn *how to* do things in a contextual, socio-cultural framework, outcomes are invariably richer. Understanding practice through engaging with others and reflecting consolidates practice in its holistic form in ways that cannot necessarily be achieved through formal learning strategies such as lectures and didactic tutorials.

In addition to recommended practices, awareness of the unintended learning opportunities highlighted through the informal learning framework may heighten educators' understanding of relevant or new pedagogies for simulation. The features of informal learning (as indeterminate, opportunistic, involving internal and external goods, and as an ongoing process) align with how many practitioners already plan and deliver simulations. As a lesser known learning framework in the simulation community, informal learning may account for what many attribute as the unique benefits of this educational technique. The perspectives presented within this paper may pique educators' interest in further exploring the relevance and applicability of the features of informal learning for planning and delivering healthcare simulations.

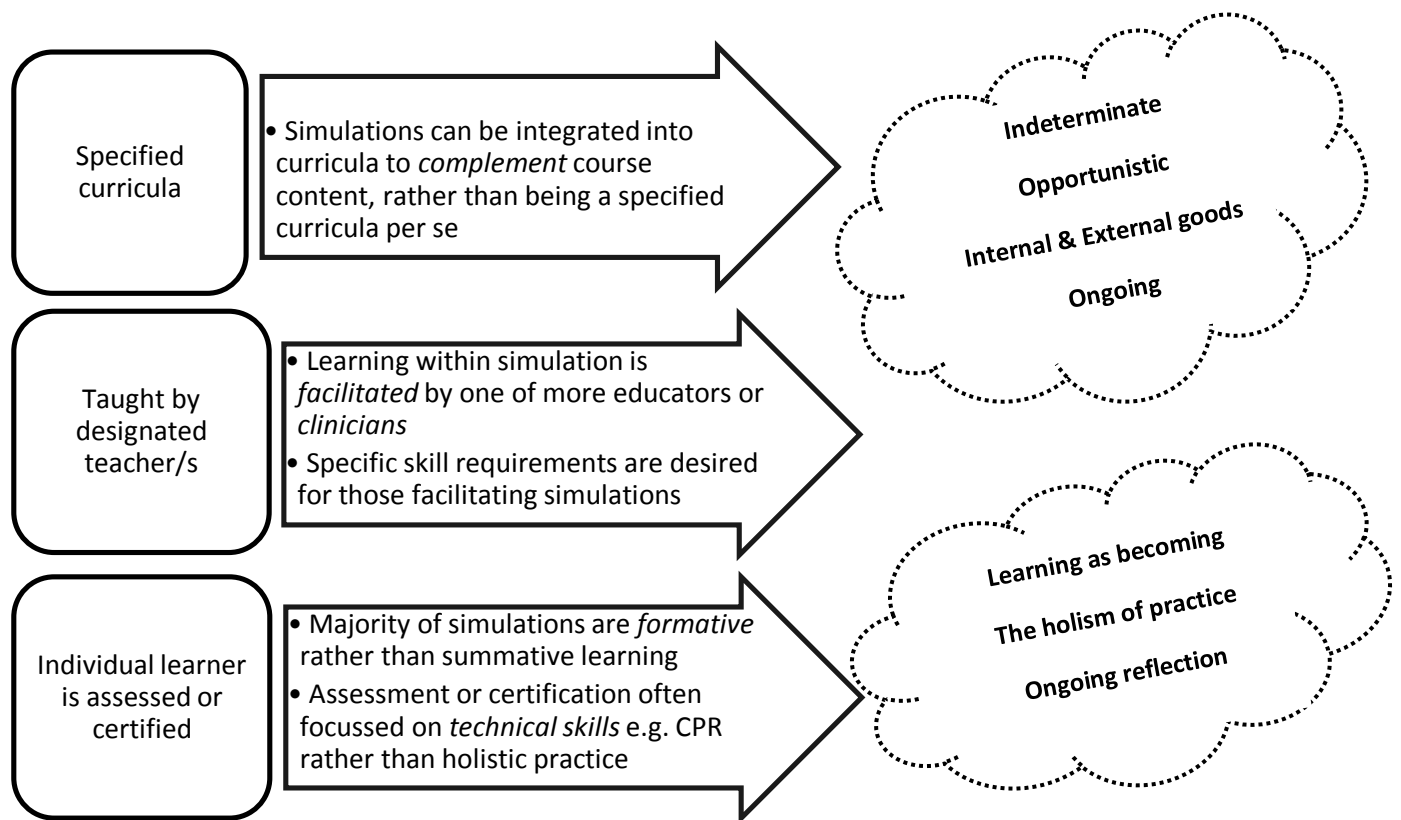


Figure 1 – Characteristics of formal learning (left), notations about informal learning within simulation (centre and top right) leading to learner outcomes (lower right).

References

- Arthur, C., Levett-Jones, T., & Kable, A. (2013). Quality indicators for the design and implementation of simulation experiences: A Delphi study. *Nurse Education Today*, 33(11), 1357-1361. doi: 10.1016/j.nedt.2012.07.012
- Boud, D. (2012). Problematising practice-based education. In J. Higgs, R. Barnett, S. Billett, M. Hutchings & F. Trede (Eds.), *Practice-Based Education: Perspectives and Strategies* (pp. 55-70). Rotterdam: Sense Publishers.
- Creswell, J. W., & Plano Clark, V. L. (2011). *Designing and conducting mixed methods research*. Thousand Oaks: Sage.
- Disler, R., Rochester, S., Kelly, M. A., White, H., & Forber, J. (2013). Delivering a large cohort simulation - beginning nursing students' experience: A pre-post survey. *Journal of Nursing Education and Practice*, 3(12), 133-142. doi: 10.5430/jnep.v3n12p133
- Eraut, M. (2000). Non-Formal Learning, Implicit Learning and Tacit Knowledge. In F. Coffield (Ed.), *The Necessity of Informal Learning*. Bristol: The Policy Press.
- Gaba, D. (2007). The Future Vision of Simulation in Healthcare. *Simulation in Healthcare*, 2, 126-135. doi: 10.1097/01.SIH.0000258411.38212.32
- Hager, P. (2011). Theories of workplace learning. In M. Malloch, L. Cairns, K. Evans & B. N. O'Connor (Eds.), *The International handbook of workplace learning: Theory, research, practice, and issues*. (pp. 17-32). London: Sage.
- Hager, P., & Halliday, J. (2006). *Recovering informal learning: wisdom, judgement and community* (Vol. 7). Dordrecht: Springer.
- Howard, V. M., Englert, N., Kameg, K., & Perozzi, K. (2011). Integration of simulation across the undergraduate curriculum: Student and faculty perspectives. *Clinical Simulation in Nursing*, 7 (10), e1-e10.
- Illich, I. (2000). *Deschooling Society*. London: Marion Boyars Publishers Ltd.
- Jeffries, P. (Ed.). (2007). *Simulation in nursing education: from conceptualization to evaluation*. New York: National League for Nursing.
- Kelly, M. A. (2014). *Investigating the use of simulations in enhancing clinical judgement of nursing students to practice as registered nurses*. (Doctor of Philosophy), University of Technology Sydney.
- Kelly, M. A., Forber, J., Conlon, L., Roche, M., & Stasa, H. (2014). Empowering the registered nurses of tomorrow: Students' perspectives of a simulation experience for recognising and managing a deteriorating patient. *Nurse Education Today*, 34(5), 724-729. doi: 10.1016/j.nedt.2013.08.014
- Sinclair, B., & Ferguson, K. (2009). Integrating simulated teaching/learning strategies in undergraduate nursing education. *International Journal of Nursing Education Scholarship*, 6(1), Article 7. doi: 10.2202/1548-923X.1676