



## Improving performance amongst nursing students through the discovery of discrepancies during simulation



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### ABSTRACT

Discrepancy creation is a form of self-regulated learning which can be used to improve individual performance. Discrepancy can be created as a result of comparison against an occupational standard or when an individual strives to achieve higher personal goals. This study explores the process of discrepancy discovery and reduction following simulation sessions. Second year under-graduate nursing students undertook three simulation sessions over a one year period. After each session the participants completed a series of visual analogue scales to rate their own performance and the perceived performance of peers, final year student and a newly registered nurse. Once discrepancy had been identified, participants were asked to produce a short written action plan on how the discrepancy could be addressed and to work on this action plan between sessions.

A total of 70 students completed discrepancy scores for all three scenarios. The most common areas of discrepancy were understanding physiology, understanding medicines and pharmacology, patient assessment and handover (hand off). Wilcoxon Signed Ranks suggested a statistically significant difference between student scores in all areas with the exception of team-work. All of the participants used peers as their comparator when identifying discrepancy. There was also a statistically significant difference in the scores following each simulation session suggesting improved performance.

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### Introduction/background

Discrepancy creation is a concept articulated by Organizational Psychologists to describe how employees strive to improve their individual performance. Phillips et al. (1996) describe how discrepancy creation involves either the measurement of current performance against a standard (negative discrepancy creation) or by driving achievement when an individual sets higher personal goals (positive discrepancy creation). Phillips et al. (1996) argue that until an individual has achieved the level of an occupational standard they will not engage in positive discrepancy creation but rather they will direct their efforts at achieving the occupational standard. Nursing students by virtue of their role are engaged in negative discrepancy creation as they are seeking to achieve the occupational standard by becoming a registered nurse. Once discrepancy has been created, the individual works towards

discrepancy reduction by directing cognitive and behavioral efforts towards reducing the level of discrepancy identified (Nicklin and Williams, 2011).

While discrepancy creation and reduction has been used to study human motivation, goal setting, performance of employees, school children and athletes the concept has not been widely applied to nursing or health professional's education. Discrepancy creation is a form of self-regulated learning. Schunk and Zimmerman (2011) described how self-regulated learning involves 3 phases; the targeting thoughts and feelings (perception phase), taking actions (goal setting and planning phase) and the adaption phase which involves the evaluation of performance and adjustment of goals and strategies. Self-regulated learning involves a number of processes but of particular interest in terms of simulation, are the importance of feedback and de-brief in activation of interest, identifying goals and monitoring progress (Pintrich, 2005; 452).

Within nurse education there has been some concern that self-directed learning is often used inappropriately and occasionally lacks the structure necessary to achieve particular outcomes (Timmins, 2008). Additionally, it appears that this approach is

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sometimes unpopular amongst nursing students (Walsh, 2004) and that self-directed ability may be confined to those students who are high achievers (McCauley and McClelland, 2004). Timmins (2008) argues that for self-directed learning to be successful there needs to be investment in the students in terms of facilitating the development of their own learning needs, goals setting and action planning. This approach appears to fit with the creation and subsequent addressing of discrepancy.

Discrepancy creation is based on social constructivist learning theory where the learner constructs through a process of reflection and analysis of their own performance discrepancy between their current performance and that of a comparator they aspire to. It is unclear whether students base this discrepancy on peers, on students at a more advanced stage of their course or on the ultimate outcome of the course becoming a registered nurse.

Nicklin and Williams (2011) identify that self-efficacy, feedback and task interest are important factors in goal revision when an individual addresses a discrepancy. Self-efficacy is perceived as important as individuals with low self-efficacy are likely to set less challenging goals than those with higher levels. Less challenging goals will be easier to achieve and, as a result, the individual may lose interest in developing and may fail to maximize their potential. O'Keefe and Linnenbrink-Garcia (2014) describe how individuals are more likely to improve their performance where they see the task as personally significant and of interest. In addition, individuals who are focused on learning new things and seeking out new challenges are thought to have a strong learning goal orientation and are, therefore, more likely to create and address discrepancy.

Hesketh and Ivanac (2002) outlined the essential requirements for the self-regulation of performance including performance indicators which were capable of being controlled and achieved by the individual without the need to manipulate external factors. Feedback was identified as an essential requirement both in terms of identifying discrepancy but also in judging performance improvements. Feedback needs to be acceptable and specific. A systematic review undertaken by Neubert (1998) identified that adding feedback to goal setting almost doubled the impact in terms of performance improvement over goal setting alone. The results of the meta-analysis indicated that there was little or no difference between feedback presented personally and that which was presented impersonally to a group of people. Irrespective of the method of feedback, it must be relevant and accurate (Archer, 2010).

Feedback to individuals, to develop their knowledge of their own performance, has been described as the single most important feature of simulation based education (Issenberg et al., 2005). Within simulation feedback usually takes the form of a structured de-brief or guided reflection on action. Fanning and Gaba (2007; p116) have described how de-brief is seen as a key component of simulation based education because 'not everyone is naturally capable of analyzing, making sense, and assimilating learning experiences on their own'. Despite the importance of feedback it remains largely unclear how students then use the feedback to structure future learning. However, within nursing education student self-assessment has been developed alongside simulation based education as a way of promoting and enhancing student self-directed learning (Cato et al., 2009). It has been suggested that student self-assessment can enable students to set goals and then subsequently monitor progress towards these goals (Nichol and Macfarlane-Dick, 2006). This suggests that a structured approach to self-assessment alongside faculty feedback and structured reflection may be a useful approach to structure future self-regulated learning amongst student nurses.

Finally, Koch and Nafziger (2008) also outline how goal setting is the cornerstone of the self-regulation of performance. Goals need to be acceptable to the individual and should be attainable and prioritized when a number of different areas require attention. Radosevich et al. (2007) founds that an individual's given freedom to set their own goals accrue more positive benefits than those assigned goals by an external agent. Whether an individual is able to set their own goals or would prefer goals to be set for them will depend upon the individual's locus of control. Gymnasts with an internal locus of control have been shown to achieve more performance improvement when they are able to set their own goals than when goals were set by a coach (Lambert et al., 1999).

In this study a discrepancy was defined as a deficit in the student's practical performance, knowledge, care management or team working ability. It can be argued that performance discrepancy is not created by discovered. Creation involves bringing something into existence and it is likely that the discrepancy in the student's performance already existed. Therefore, while the psychological term is discrepancy creation the term discrepancy discovery is preferred in this study.

The aim of the study was to explore the discovery of discrepancy between the student's current and perceived optimal performance following participation in simulation exercises. The researchers were interested to ascertain whether discrepancy discovery was a useful way of assisting nursing students to plan their own learning and development.

This study aimed to answer the following research questions:

1. Does structured de-brief as part of simulation exercises allow for the discovery of performance discrepancy by students?
2. Which comparator group (e.g. peers, students at a different point in the program or registered nurses) is the most effective at assisting students to identify discrepancy?

### Research design

The study used a quasi-experimental case study design. The case studies involved groups of under-graduate nursing students undertaking simulation sessions in groups of 4–6 students. Yin (2003) describes how a case study is a research strategy that seeks to answer how and why questions and accommodates situations where the researcher has minimal control over real life events. Nurse educators conducting evaluation research find case studies particularly useful as they allow for the explanation of presumed causal relationships in real life situations which may be too complex for experimental strategies (Amerson, 2011). Cohen et al. (2007) describe how single case research designs have become increasingly popular in educational research. Characteristically, such designs involve:

- Continuous assessment of performance over a period of time with multiple measures being recorded at different points
- Multiple interventions which are replicated over time with the same group of students

This methodology was selected because it was the least intrusive given that the simulation sessions were a key element of the program and, therefore, it was not possible to randomly assign students to an intervention and to a control group.

### Simulation delivery

One cohort of second year under-graduate nursing students (n = 210) undertook three simulation scenarios during the course

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