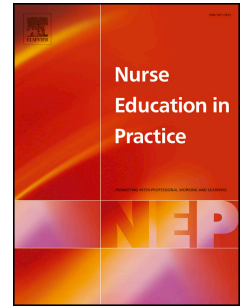# Journal Pre-proof

An investigation into the impact of approaches to learning on final-year student nurses' clinical decision-making

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An investigation into the impact of approaches to learning on final-year student nurses'

clinical decision-making

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An investigation into the impact of approaches to learning on final-year student nurses' clinical decision-making

Introduction

This paper reports on the substantive of a mixed-methods research project undertaken for the Doctorate in Education, which seeks empirical evidence of a relationship between approaches to learning and clinical decision-making of student nurses at a UK university and, more specifically, a correlation between affiliation to the deep approach to learning and 'expert' approaches to decision-making in clinical practice. Sabzevari *et al.* (2013) conclude that to 'educate competent nurses, teachers should pay attention to learning approaches' (p. 161). We argue here that to educate the 'new future nurse' to meet the challenges of 'emerging health-care needs' (NMC, 2018b; Tanner, 2010), it is of singular importance for nurse educators to come to an understanding of how practice learning evolves and to recognise the potential of the deep approach to learning in optimising decisional learning and clinical reasoning and judgement skills in practice.

Much has been written on approaches to learning in nurse education (Postareff *et al,* 2015), and there is also 'a rich heritage of research into decision making and judgement' in nursing research (Thompson, *et al,* 2013, p. 1720). However, in much of the research literature, approaches to learning and clinical reasoning and decision-making are not taken to be contingent on each other but understood as owning separate spaces with individual explanatory frames of reference. The apparent emphasis on the role of approaches to learning in the assessment of nursing students' learning in the 'school' setting (Gürlen *et al,* 2013; Rochmawati, *et al,* 2014) limits our understanding of its latent power to effect changes in the way nurses think in practice. It is our contention that optimal decision-making in the practice setting rests on the 'joined-up' nature of the educative process, and establishing a clear

correspondence between approaches to learning and clinical decision-making can play a major role in the development of *integrative*, interventional endeavours at decision improvement (Thompson *et al,* 2013).

Research into students' learning in higher education reveals learning to be a dynamic human activity (Deakin Crick *et al,* 2015)**,** defined as the operational pattern of learning behaviours that is activated when processing new information or experiences (Entwistle, 2000; Diseth *et al,* 2010). In a dynamic system, learners are taking responsibility for and making decisions about their learning, actively identifying learning needs and ways to overcome learning deficits (Edosomwan, 2016). This involves students' construction of a personal meta-learning function and an awareness of how their learning behaviours can be re-constituted and self-modulated (Diseth *et al,* 2010; Postareff *et al,* 2015). It is the conscious decision on a learning process pathway, 'energised by a personally chosen and meaningful purpose' (Deakin Crick *et al,* 2015, p. 145,) that frames the desired learning outcomes and has important implications for decision-making. This notion is central to Approach to Learning Theory.

Approaches to Learning Theory

Marton and Säljö's (1976) seminal phenomenological research found clear differences between the way students approached their learning when undertaking an academic task determined by their purpose in commencing the task and the process used in undertaking the task (Marton *et al,* 1997). Variations underwent thematic analytical reduction, generating two categories of processing with contrasting outcomes, 'deep level' and 'surface level', and the concept 'Approach to Learning' (ATL) was adopted as capturing the essence of this phenomenon. Marton and Säljö theorised that to actualise their learning intentions, students

use specific strategies to learn (Diseth, 2010; Gürlen *et al*, 2013). Students adhering to the surface approach aim at learning the minimum required to meet course assessment criteria (Entwistle, 2015), avoid failure by memorising material in a disjointed manner (Gürlen *et al*, 2013), lack a sense of purpose, have little genuine interest in the course subject, and their intention is to just 'cope' (Entwistle and Peterson, 2004). Those adhering to the deep approach have an 'intrinsic interest . . . in learning' (Deakin Crick and Goldspink, 2014, p. 28) and an intention to understand, or make meaning of, the subject matter, to think critically, to evaluate arguments, and to use evidence to inform judgements.

Entwistle and Ramsden's (1983) research on students' understanding of learning, added a third dimension to Marton and Säljö's bi-polar model – the 'strategic approach'. Students using the strategic approach employ an organised, systematic method to *study*-learning which focuses on assessment criteria and meeting pre-specified targets to obtain the highest grades possible (Entwistle, 2000). It was recognised that students employing the strategic approach combine components of the deep and surface approaches to attain their goal (Entwistle, 2000) and is used when students are driven to be successful and aim to 'maximise their grades for their own practical benefits and ego-enhancement' (Biggs, 1979, p. 383).

Approaches to Learning Theory has gained international recognition as an investigative tool in research into tertiary level learning. The model has, notwithstanding, undergone close scrutiny, notably by Haggis (2003), who suggests that the deep approach to learning is an iteration of the utopian goals for the academic élite that has little relevance to the majority of students in a mass educational system. Richardson (2000) criticises the theory as 'a cliché in discussions about teaching and learning in higher education' (p. 27) and Haggis (2009) further argues that questions over the number of students who adopt the surface approach

'remain largely unanswered' (p. 378). Whilst acknowledging the arguments for using Approaches to Learning Theory with circumspection, this research follows Entwistle's (1997) earlier contention that a coherent body of empirical research testifies to the validity of the ATL model in explaining the precondition for learning, and has the capacity to originate interventions to improve engagement in learning and the quality of teaching and learning for both faculty and students.

Approaches to learning intervention

The mission of the study reported here was, at its inception, 'to boldly go' into the 'unknown' to which Thompson and Stapley (2011, p. 881) refer when they say, 'the effectiveness of educational interventions to improve nursing judgement and decision making is unknown.' Professor Brian Webster adds: 'It is striking that there is relatively little research evidence on practice oriented innovative teaching and learning interventions, nationally or internationally' (Dearnley *et al,* 2013, p. 4). This makes identification and design of effective practice-oriented interventions problematic. As a jumping off point, we take Walters' (2012) definition of metacognition: 'an individual's ability to stand back from their thinking to observe it and recognize opportunities for interventional strategies. It requires awareness of the learning process…' (p. 117). The pivotal importance of 'awareness of the learning process' in any intervention aimed at improving clinical thinking and judgement is manifest and educating nursing students to that end, is key to effective learning intervention.

Li's (2012) literature review on approaches to learning contributes much to advance work on designing interventional strategies by identifying six 'perspectives' on learning which are instrumental in raising students' awareness of learning processes and re-orienting students to a deep learning approach: problem-based learning, inquiry-based learning, self-regulated learning, situated and embodied cognition, collaborative learning, and cognitive

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apprenticeship. We propose in this paper that these perspectives align with the deep approach and give us a blueprint for a *practice-integrated learning* interventional architecture which corresponds structurally to the learning processes involved in clinical decision-making, as summarised by Standing (2010, p. 7): 'Clinical decision-making is a complex process involving observation, information-processing, critical thinking, evaluating evidence, applying relevant knowledge, problem-solving skills, reflection and clinical judgement…'

The study

Aims

This study aimed to identify a relationship between Adult Nursing students' approaches to learning and their clinical decision-making, and whether an intervention centred on applying 'deeper learning' strategies in learning situations would move students to adopt the deep approach.

Methods

Design

A longitudinal, correlation-intervention design was used. Initial survey data was collected from all participants at the beginning of the final year of the adult nursing course. Participants were invited to participate in the integrative learning intervention workshops, which were facilitated monthly from January to June 2015, following the pre-intervention data collection. Participants were re-surveyed at the end of the year in August 2015. Following the quantitative phase and post-intervention data collection and based on Wisdom and Creswell's (2013) 'sequential embedded' design (p. 3), semi-structured interviews were conducted with a purposive sample ($n = 9$) of students from each of the ATL categories. The interviews were digitally recorded and transcribed, and the data subjected to inductive thematic analysis (Braun and Clarke, 2006).

Participants and context

 All final year students who were enrolled on the adult nursing courses at a multi-campus university in London, England, in September 2014 were invited to participate and informed of

 the study and the recruitment process by a notice posted on the university's virtual learning environment (VLE) portal. Participant Information and Consent to Participate forms attached to the electronic posting assured potential participants that anonymity and confidentiality would be observed, and that participants' names would be disassociated from the data and replaced with pseudonyms. Further reassurances included research data being kept secure in a locked filing cabinet and on a password-protected computer file in the researcher's office at the University. Students were informed that participation, or refusal, would not impact upon their course of study and they could withdraw at any point without any penalty. The study commenced following the approval of the University's Research and Ethics Committee (UREC) and signed consent from participants.

Instruments

The self-reporting Approaches to Study Skills Inventory for Students (ASSIST) (Tait *et al,* 1998), based on Marton and Säljö's (1976) deep and surface approaches and Entwistle and Ramsden's (1983) strategic approach, was used to measure and quantify the students' approaches to learning. The fifty-two multiple choice items are grouped into thirteen subscales which comprise the three ATLs (Table 1).

TABLE 1. Approaches to Study Skills Inventory for Students (ASSIST)

Scale	Subscale
	Relating ideas

Deep approach	Use of evidence
	Interest in ideas
	Seeking meaning
Strategic approach	Time management
	Alert to assessments
	Achieving
	Monitoring effectiveness
	Organised studying
Surface approach	Unrelated memorising
	Syllabus boundness
	Fear of failure
	Lack of purpose

(Source: Tait, Entwistle and McCune, 1998)

The extent of an 'instrument's reliability is reflected in a Cronbach's alpha (α) value of equal to or above 0.7 as a minimum measurement' (Pallant, 2013, p. 101). The ASSIST's reliability has consistently yielded satisfactory Cronbach's Alpha values of 0.76-0.89 across multiple disciplines (Brown *et al,* 2015; Coffield *et al,* 2004). Analysis of the fifty-two items on a 5-point likert scale *(1= strongly disagree* and *5 = strongly agree*) followed Tait *et al.*'s *(*1998) stipulated guidelines. Scores were created by adding the relevant sub-scales scores which contribute to each ATL. The largest score indicates the participant's inclination towards that specific ATL.

Participants' clinical decision-making was measured using Jenkins' (1985) Clinical Decision-Making Nursing Scale (CDMNS), which is divided into four subscales (Table 2). The CDMNS has an established internal consistency reliability of 0.83 (Jenkins, 1985, p. 225) and has been tested in over ninety research studies (Canova *et al*, 2016).

TABLE 2. Clinical Decision-Making Nursing Scale (CDMNS) subscales

Subscale A	Search for alternatives
Subscale B	Canvassing of objectives and values
Subscale C	Evaluation and re-evaluation of consequences
Subscale D	Search for information and unbiased assimilation of new information

(Source: Jenkins, 1985)

The 5-point likert scale has the following response measurements: *always = 5, frequently = 4; occasionally = 3, seldom = 2* and *never = 1*. Each item questions the respondents about their clinical decision-making when administering care in clinical practice. The CDMNS's analysing guidelines stipulates that twenty-two of the items are positively rated and employ the above scoring format. The remaining eighteen items are negatively rated with the frequency anchor reverted to: *always = 1* to *never = 5*. The higher the overall score value, the more positive the participant's clinical decision-making ability (Jenkins, 2001). To align the questionnaire to the contemporary phraseology with which the UK-based participants were familiar: 'professional literature' was changed to 'journal articles' and 'clinical instructor' changed to 'mentor in practice'. A researcher-constructed demographic questionnaire requested data on the participants' age, gender, and nursing course pathway (BSc Hons or Postgraduate Diploma).

Learning Intervention

Initially, the intervention design was broadly-based on the cognitive, metacognitive, and affective dimensions in Hattie *et al.* (1996). The design was then refined with reference to Li's (2012) review on approaches to learning, as it was seen to have practical applications in operationalising deeper approaches. Five of Li's 'perspectives' on learning were found to intermesh with the learning approach sub-set of the deep approach and incorporated into the design (see Table 3).

TABLE 3. Correspondence of Deep Approach subscales and learning intervention strategies

Deep Approach to Learning subscales	Interventional learning strategies
Relating ideas	Problem-based learning
Use of evidence	Inquiry-based learning
Interest in ideas	Self-regulated learning
Seeking meaning	Situated and embodied cognition
	Cognitive apprenticeship

The intervention workshop topics comprised literature searching and critiquing research, evidence-based research methods, critical thinking and problem-solving skills, and discussions on enhancing engagement with learning. The intervention workshop programme and learning materials were peer reviewed by university faculty and approved by UREC before implementing.

Data analysis

The Statistical Package for Social Scientists (SPSS) IBM Version 21.0 was used to examine the data. Pallant (2013) contends that ordinal (ranked) scales and categorical, interval data, such as the data collected in this study is best analysed using non-parametric techniques. Following Bruin (2006), parametric T-tests were not considered as researchers cannot assess nor confirm that participants perceive the intervals between the items in the scales as being equidistant. The non-parametric version of the one-way between groups Analysis of Variance (ANOVA) Friedman Test identified whether significant relationships existed between the research variables (Pallant, 2013). The Wilcoxin non-parametric test determined the statistical significance of the relationships between the sample's ATLs and CDMs. The specific subscale element that contributed to the participants' preferred ATL was also identified. Spearman's Rank Order Correlation was used to investigate whether participants' approaches to learning correlated with their clinical decision-making. Bonferroni adjustments were included to decrease the risk for a type-one error (Coolican, 2014).

Interview analysis began with familiarising oneself with the data and then coding the transcripts to create categories. Thereafter, categories were collated into themes and with abstraction, into wider concepts. To enhance credibility and transparency, participants' original quotes are embedded within the findings (Braun and Clarke, 2006).

Summary of Findings

Descriptive findings

Participants' ages ranged from 20 to 60 years. A majority of the participants were in the 20-30-year category. Female participants exceeded male participants by 59%. A larger percentage of participants (51.3%) had no previous healthcare experience (Table 4).

TABLE 4. Participants' Age, Gender and Previous Healthcare Experience Frequencies

| Data category		Number (78)	Percentage (%)
	< 20 years	5	6.4
	20-30 years	37	46.0
Age	31-40 years	24	30.8
	41-50 years	11	14.1
	51-60 years	1	1.3
Gender	Male	16	20.5
	Female	62	79.5
Previous healthcare experience	Yes	38	48.7
	No	40	51.3

Pre-intervention findings

At the pre-intervention point, 21% of the sample registered an affiliation to the deep approach, whilst affiliations to the surface and strategic approaches were weighted at 38% and 41% respectively. The subscale 'monitoring effectiveness' contributed to the strategic approach being the participants' dominant approach. A preference for the surface approach by thirty-eight percent (38%) of the participants resulted from subscales 'syllabus boundness' and 'fear of failure'.

Clinical decision-making findings revealed that the subscale 'search for alternatives' was rated of least importance when making clinical decisions and contributed to low clinical decision-making scores. Participants who produced high clinical decision-making scores indicated that the subscale 'canvassing of objectives and values' was significant when making clinical decisions. The Spearman's *rho* analysis revealed a strong positive, statistically significant correlation between the participants' ATL and clinical decision-

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making, r (strength of the relationship) = 1.000, $N = 78$, $p < 0.005$ (Pallant, 2013) (Figure 1). Before the intervention, participants with the highest clinical decision-making scores indicated an ATL orientation to the strategic approach, whilst those with the lowest CDM scores, to the surface approach.

FIGURE 1: Pre-intervention Approaches to Learning and clinical decision-making correlation
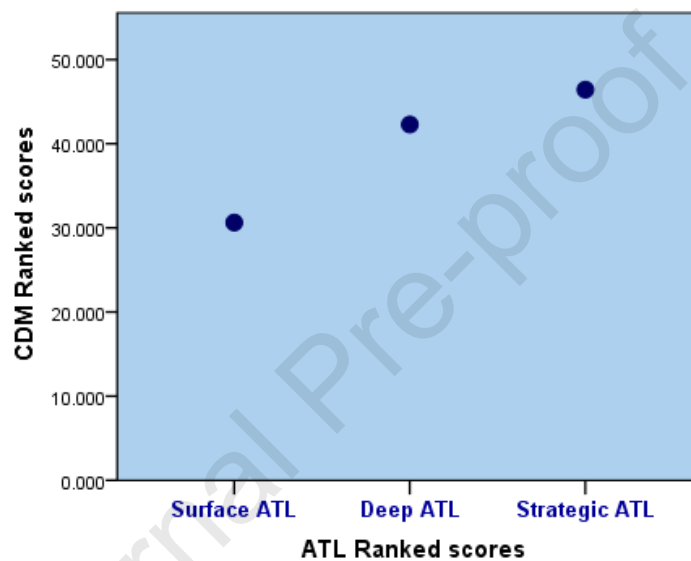
Post-intervention findings

Statistically significant findings were also evident in the post-intervention analysis. The adoption of the deep approach increased by 5%, resulting from participants indicating a greater inclination towards subscales 'seeking meaning and 'relating ideas', whereas adoption of the surface approach decreased by 30% from the pre-intervention results. There was a marked rise in participants' preference for the strategic approach, resulting from subscales 'alertness to assessment', 'organised study', 'achieving', and 'monitoring effectiveness'. Female participants showed an increase in affiliation to the strategic approach of 32% between pre- and post-intervention data collection points while male response rate remained static. Male participants' predisposition for the deep approach exceeded female participants

by 34%. Stronger clinical decision-making scores were influenced by subscale 'evaluation and re-evaluation of consequences'. The Cronbach's Alpha scores of 0.94 for the deep approach, 0.93 for the strategic approach and 0.80 for the surface approach certifies the internal consistency of the findings in this study (Pallant, 2013) (Table 5).

TABLE 5. Pre- and post-intervention comparison of ATL proclivity

	Pre-intervention (n = 78)					Post-intervention (n = 78)					α
ATL	N	%	F (62)	M (16)	Influencing subscale	N	%	F (62)	M (16)	Influencing Subscale	
Surface	30	38	42%	25%	-Syllabus boundness -Fear of failure	6	8	10%	13%	-Lack of purpose -Unrelated memorising -Fear of failure	.80
Strategic	32	41	42%	38%	-Monitoring effectiveness	52	67	74%	38%	-Organised study -Alert to assessment -Achieving -Monitoring effectiveness	.93
Deep	16	21	16%	38%	Relating ideas	20	26	16%	50%	-Seeking meaning -Relating ideas	.94

p<.005

*F = Female
*M = Male
α = Cronbach's Alpha

Following the intervention, preferences for the CDMNS subscales changed (Table 6).

Table 6. *Pre- and post-intervention comparison of CDMNS subscales*

CDMNS subscales/ values	Pre-intervention (n = 78)	SD	Post-intervention (n = 78)	SD

Highest median value	Canvassing of objectives	40.62	.001	Evaluation of consequences	41.51	.001
Lowest medium value	Search for alternatives	35.40	.010	Search for information	37.40	.162

*SD = Significant difference

At the post-intervention analysis, Spearman's *rho* revealed that a strong, positive, statistically significant relationship existed between the deep approach and participants' clinical decision-making (Figure 2). At both pre- and post-intervention data analyses, a negative correlation existed between the surface approach and clinical decision-making.

FIGURE 2. Post-intervention Approach to Learning and Clinical Decision-making correlation
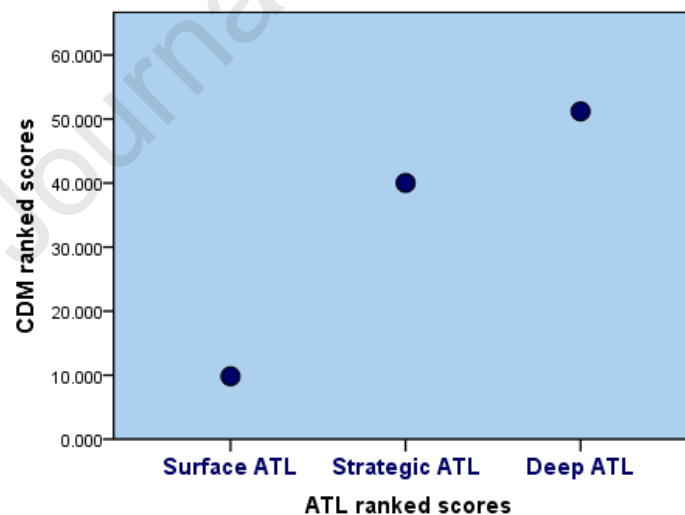
Interview findings

Weighing quantitative and qualitative data in equal measure was not the goal of this research and the quantitative was always intended to take precedence. The inclusion of the qualitative phase, however, adds that extra layer of novel insights into the

participants' experience of the learning intervention and changing dispositions towards learning not easily recognised quantifiably.

The data set reveals that some students perceived the intervention in pragmatic and instrumental terms, erring on the side of strategic approaches to 'study', with, nevertheless, inchoate indications of moving towards 'making meaning' of the learning matter:

> The course is very intense, so we are not always sure how to organise ourselves and manage our time.
>
> …intervention helped prepare assignments . . . I understood the topic better, finally understood how to critique research articles . . . my academic writing improved . . . and ended up with higher marks in my Best Practice assignment, so it's been good for me.

One student stressed the importance of the intervention in providing spaces to reflect on the learning experience and make connections between learner identity and professional trajectory:

> During the talks you gave about devoting time to our learning, it just clicked – this is about me and my career.

Another participant expressed a conviction that involvement had stimulated their interest in ideas and dialogic learning:

> I felt motivated to use other resources and share ideas that I read about.

Other students valued their participation in the research as contributing to personal and professional growth seeing the interventional learning activity as acting reciprocally on their personal development and practice-learning-in-action – a vehicle for increasing their decisional capital:

> . . . highlighted my strengths and weaknesses . . . I now read notes after lectures and this learning has increased my confidence when I'm in the ward making decisions. This should be done at the beginning of the course!

This participant, who had re-oriented from the strategic to the deep approach, points to the integrative function of the intervention, bringing academic-based learning and practice-based

learning into close alliance, but notes, that the interventional programme might have greater impact if positioned earlier in the course.

Discussion

The empirical findings in this study shows a statistically significant relationship between nursing students' approach to learning and their clinical decision-making and that the deep approach to learning correlates positively with good clinical decision-making. It is immediately apparent that students who adopt the deep approach have a greater propensity for effective decisional learning and clinical judgements than students who adopt either the strategic or the surface approach.

It should be remembered that the core aim of this research was not to directly improve students' CDM, rather to raise awareness of how a hold on the attributes of deep approach complements, as one interviewee suggested, sound, 'confident' clinical decision-making. Crucial to this understanding is uncoupling from surface learning approaches 'characterised by reproduction, categorising of information, or replication of simple procedure' (Wilson Smith and Colby, 2007) and findings clearly signal a movement of students away from that surface approach. Evidence of the potential to change approaches to learning to ameliorate decisional learning and accrue decisional capital is consistent with the 'ability to modulate' modes of thinking that enables good clinical decision-making (Walters, 2012, p. 117).

The change in students' predilection for certain approaches to learning between pre- and post-intervention stages suggests a degree of reflexivity and a fundamental shift in students' personal beliefs regarding the value of learning about their own learning. Biggs's (1985) contention that meta-learning can be defined as 'being aware of and taking control of one's

own learning' (p. 204) rings true and adds weight to the argument that learning about Approaches to Learning Theory and taking an active part in the learning intervention gave students the opportunity to take control, self-regulate their learning approach and modify learning behaviours. The assumption, however, that students develop these higher functioning meta-learning skills autonomously is without any real foundation. Initiatives, or interventions, that lead students to activate the higher order mental functions designated in the attributes (subscales) of the deep approach are, or should be, integral to nurse education in nurturing the agency and autonomy essential to the 'future nurse' role.

When we use the term 'higher order mental functions', we recognise the cognitive complexity of the deep approach. There is little doubt in our minds that the two strands of the deep approach, 'seeking meaning' and 'relating ideas', most prominent in its take-up in this study demand the same complexity thinking involved in the complex clinical judgement calls made by nurses in practice. Making meaning of one's learning (understanding) and relating ideas (relationships between concepts) enables the establishment of a cognate syntax on the often-confusing cues that present in the uncertainty of the decisional moment. As Walters (2012, p. 114) observes, 'diagnostic accuracy was related to an *understanding of relationships between concepts*' rather than aggregation of conceptual abstractions.

It may well be the case that the higher order processes constitutive of deeper learning approaches and sound decision-making are situated in the practices in which we participate, both in work contexts and in the life choices and decisions we make in adult life. More 'mature' students, in the 31-40-year age category, oriented to the deep approach than younger participants, suggesting that older students' life experiences may be a critical variable in problem-solving that is demanded in decisional learning. Not the sole determinant of disposition to deep learning approaches but certainly a factor, it identifies the mature student

as better able to 'work on themselves at university' and invest in personal resources to build learning capital (Jin and Ball, 2020, p. 257). Younger students are more likely to hold onto the handle of subordination and dependency acquired, presumably, during compulsory education and less likely to adapt and restructure their learner identity.

Restructuring learner identity should not be thought to happen as soon as students cross the threshold of higher education. Findings from the initial data collection reveal that for many students on higher education nursing courses, despite having reached the final year of their course, their growth as learners is still stunted by the surface-level dimensions of 'syllabus boundness' and 'fear of failure'. It would seem these nursing students' experience of higher education simply reproduces the subjection and dependency experienced in performance-centred, qualification-oriented cultures prevailing in compulsory schooling environments.

When Rochmawati *et al,* (2014, p. 729) tell us that adoption of the strategic approach is 'found to be determined by students' perception of and experience of the educational environment', the sort of student experience described here might account in some measure for the considerable uptake of the strategic approach evident in the post-intervention data analysis. Given that the post-intervention data collection at the end of the final year coincided with end of course assessments, when students were also on assessed clinical placements, students' perceptions of the *educational* purpose of learning intervention activity may have been confounded by the pressures put on them by impending assessments. The purpose of the intervention may, indeed, have been misconstrued by students as directed at higher grades in those assessments and participation in the intervention a way of self-identifying as a high-achieving learner. This bore heavily on learners' investment in 'tried and tested' approaches to 'achieving' represented by elements of the strategic approach, 'monitoring effectiveness',

'alert to assessments', 'organised study', and 'achieving', drivers of increasing numbers, notably female participants, adhering to the strategic approach. Although a 'turn' in learning approach demonstrates that students have the capacity to alter a predominant learning approach when encouraged to do so, the principals and practices embedded in the interventional learning experience may not have had time enough to become fully internalised and resistant to the controls that performance-centred educational environments exert on students.

This should not detract from the central findings of the research: the correlation of deep approach to learning and good clinical decision-making and the contingency of learning intervention. The NMC Horizon Report Higher Education Edition (2017) makes 'deeper learning' a key challenge 'on the five-year horizon for Higher Education worldwide.' While there remain reservations about equating 'higher education' as it is currently ordered to 'deeper learning', the findings here contribute to recognising the means to make this realisable in nurse education. Further research into how and when learning interventions can be integrated into nursing curricula, particularly regarding new nursing apprenticeship schemes, is imperative if the NMC challenge is to be met.

Study limitations

The study is not without its limitations. The use of the convenience sampling predisposed to greater risk of sampling bias and precluded generalisability of the findings. Being both the teacher of the participants and the researcher remains a possible source of influence on participant responses despite all efforts to the contrary. The timing of data collection points, coinciding with major assessments, may have had a deleterious effect on participants' willingness to risk changing their ATL affiliation.

Conclusion and Implications

Qualitative and quantitative methodologies combined in a single longitudinal study focusing on pre-registration Adult Nursing students' ATL and CDM do not figure prominently, if at all, in the research canon. The results of this study confirm that integrative educational interventions targeted at inculcating deep ATL can positively impact on applied learning in the practice setting in ways not previously evidenced. It suggests that establishing what, as indicated here, is a clear connection between approach to learning and clinical decision-making merits further evidential enquiry in the mission to reinvigorate educo-interventional efforts at decision improvement (Thompson *et al,* 2013).

Deep approach to learning is seen to be the most effective means of acquiring the learning capital required for good clinical decision-making and some students see it as something holistic and in which they are actively engaged. There is little doubt, however, that the study highlights some of the constraints on taking up the deep approach put upon students in a culture of measurement by the all-pervasive focus on 'learning that is readily assessable' rather than 'learning which is educationally most valuable' (MacAllister, 2016, p. 376). Many students were, so to speak, 'caught in the middle', adhering to an approach (strategic) most likely to give them gain in the short term. The learning benefits of the deep approach are clear but invoking it across the board likely aspirational rather than realisable without fundamental changes to nursing curriculum structures and audit cultures in HE.

Overall, the study shows that approaches to learning is a dynamic and, unlike learning style inventories which call upon teachers to adapt their approach to teaching to suit the students' identified learning style, calls upon *students* to restructure their approach to learning to suit

the purpose of their learning-in-action. Based on the findings, we suggest that raising students' 'awareness of the requirements of the learning process' (Walters, 2012, p. 117) empowers students to make decisions on their learning commensurate with the decisions they must make in clinical judgements. The determinants of the deep approach to learning are the very attributes of mind and thinking on which sound judgement is predicated and their positive effect on clinical decision-making cannot be underestimated.

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- Deep approach to learning correlates with good clinical decision-making

- Decisional learning in practice is contingent on students' approach to learning

- Integrative intervention empowers students to modulate learning approaches

- Performative cultures tend to militate against deep approach to learning

- Education for learning integrates academic and practice learning

An investigation into the impact of approaches to learning on final-year student nurses'

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