Nurse Education in Practice 41 (2019) 102633

Contents lists available at ScienceDirect

Nurse Education in Practice

journal homepage: www.elsevier.com/locate/nepr

Doctorate Studies

Exploration of self-regulatory behaviours of undergraduate nursing students learning to teach: A social cognitive perspective

Susan Irvine[a,1,*], Brett Williams[b,2], Mehmet Özmen[c,3], Lisa McKenna[d,4]

[a] Monash University, Wellington Road, Clayton, Victoria, Australia
[b] Head of Department, School of Primary and Allied Health Care, Monash University, Level 2, Building H, Peninsula Campus, McMahons Road, Frankston, Victoria, 3199, Australia
[c] Monash University, 9 Rainforest Walk, Room 401, Wellington Road, Clayton, Victoria, 3800, Australia
[d] Monash University, Level 1 Building 10 Chancellor's Walk, Clayton Campus, Wellington Road, Clayton, Victoria, 3800, Australia

ARTICLE INFO

Keywords:
Self-regulated learning
Peer tutoring
Nursing education
Undergraduate nursing student
Social cognitive theory
Dyadic regulation

ABSTRACT

Self-regulated learning is a model of learning situated in social cognitive theory that views learners as active participants in their learning. Similarly, peer-learning is a pedagogical approach that assigns greater autonomy to the student and known to enhance student learning. The objective of this study was to determine the self-regulated learning strategies used by final year undergraduate nursing students enrolled in a teaching unit that included a component of peer-teaching.

A mixed methods study was conducted across four campuses of one university. Three hundred and five undergraduate nursing students completed The Motivational Strategy for Learning Questionnaire and fourteen students consented to interviews.

Key findings included the high level of reported motivational and learning strategies used by students in their approach to learning, and in their roles as near-peer teachers. Learning strategies were associated with higher-order learning and near-peer teaching enhanced shared regulation using dyadic teaching.

This study has shown how participating in a formal teaching unit prior to graduating may positively influence self-regulatory behaviours and increase student confidence and is therefore uniquely situated to promoting students' anticipatory control over similar opportunities in the clinical setting once they graduate.

1. Introduction

Globally, teaching is widely accepted as a role of registered nurses. Although it is an expectation of nurses to teach peers, students, patients and their carers once they graduate (McKenna et al., 2018), few undergraduate nursing programs imbed teaching into an undergraduate degree (Irvine et al., 2017) and many nurses feel unprepared for the teaching role (McKenna and French, 2011). Addressing the need to provide nursing students with the opportunity to learn to teach, some nursing faculties provide opportunities for students to gain teaching experiences, such as through near-peer teaching activities. Near-peer teaching is defined as a student teacher with one or more years of experience than the peer learner, in the same course (Olausson et al., 2016).

Reported benefits to the near peer teacher include improved cognition linked to higher processing of information because of the preparation and delivery of an education session (Topping and Ehly, 2001; Ten Cate and Durning, 2007), improved confidence (McKenna and French, 2011; McLelland et al., 2013) and satisfaction with this pedagogical approach (Dumas et al., 2015; McKenna and French, 2011; Owen and Ward-Smith, 2014). Despite being used for many years, one of the barriers to advancement of peer-learning is a lack of consistency in its definition and lack of theory (Irvine et al., 2017).

One theory to explain how nursing students approach learning to teach is of self-regulated learning (SRL). Pintrich's model of SRL, used in this study is situated in social cognitive theory, views learners as active

* Corresponding author.
E-mail addresses: susan.irvine@vu.edu.au (S. Irvine), brett.williams@monash.edu (B. Williams), mehmet.ozmen@unimelb.edu.au (M. Özmen), l.mckenna@latrobe.edu.au (L. McKenna).
[1] Senior Lecturer, First Year College, Victoria University, 4C2111 McKechnie St, St Albans, VIC 3021, Australia.
[2] Monash University, Level 2, Building H, Peninsula Campus, McMahons Road Frankston Victoria, 3199, Australia.
[3] Level 4, FBE Building, 111 Barry Street, The University of Melbourne, Victoria, 3010, Australia.
[4] La Trobe University, George Singer Building room 317 College of Science Health and Engineering, La Trobe University | Bundoora VIC 3086 Australia.

https://doi.org/10.1016/j.nepr.2019.102633
Received 22 September 2018; Received in revised form 21 May 2019; Accepted 30 September 2019

participants in their learning process with the potential to monitor, control and regulate certain aspects of their own cognition, motivational behaviours and their environment (Pintrich, 2004). Furthermore, the theory assumes that students can improve their approach to learning and performance through use of motivational behaviours, and learning strategies play a significant role in choosing the type and quantity of support they need (Pintrich, 2004). This approach aligns with nurse education's underpinning philosophical approach to learning in fostering critical thinking, independent and lifelong learners (Kuiper and Pesut, 2004).

Studies of self-regulation in the context of peer-assisted learning are reported in the education literature, for example Liskala et al. (2011) and in the educational psychology literature (Winne et al., 2013; Whitebread et al., 2007; Järvenoja, and Järvelä, 2009). To the researchers' knowledge, no study has examined self-regulation as a construct in the context of peer-learning and teaching in the health professional literature, including nursing. Therefore, it is unknown what self-regulatory strategies are used by undergraduate students as they approach their academic work in a teaching subject and the SRL strategies they use to teach a peer, that is, how they move from the role of learner to teacher. A greater understanding of self-regulated learning strategies used by undergraduate nursing students will provide essential information to incorporate within a pedagogical framework, for teaching self-regulatory strategies to students prior to graduating.

1.1. Research questions

The following research questions were devised to examine undergraduate nursing students' use of self-regulatory learning strategies:

- What are reported self-regulatory strategies utilised by undergraduate near peer teachers in an educational learning program?
- To what degree do constructs that measure SRL correlate?
- What self-regulatory strategies do NPTs utilise to teach a procedural skill?

2. Methods

2.1. Design

A concurrent mixed methods design with a convergent approach as described by Creswell (2014) was employed. It has been suggested that understanding self-regulatory behaviours of students learning to teach, using both quantitative (survey) and qualitative data (interviews) provides a richer understanding than could be provided by the qualitative or quantitative results alone (Cresswell, 2014).

The mixed methods design attempts to integrate or merge insights gained from both qualitative and quantitative approaches and is therefore compatible with combining quantitative and qualitative methods in research (Creswell et al., 2003). It is viewed as an approach that draws upon strengths and perspectives of both qualitative and quantitative methods, recognising the importance of fully exploring the phenomenon under study (Östlund et al., 2011). In this case, quantitative and qualitative data collection was performed concurrently, immediately following the NPT session, with priority being equal between the two components (Creswell et al., 2003). In the study design, integration of the results of both methods occurred during the interpretation phase. The interpretation used convergence of the findings to strengthen knowledge claims and explain any lack of convergence that resulted (Creswell et al., 2003).

2.2. Setting

The School of Nursing and Midwifery at a university in Australia was the setting for this study. At the time of the study, there were four campuses of the university in the State of Victoria, with 393 third year undergraduate nursing students participating in a teaching unit conducted over one academic semester in the year that the study was conducted. The teaching unit was a compulsory core unit offered over one academic semester in the final year of the undergraduate nursing course, designed to assist students in developing skills in teaching and awareness of the role of nurses as teachers. The unit included teaching and learning theories, the role of teaching, planning, developing and evaluating teaching in nursing. As part of the unit assessment, final year students were required to teach the skills of vital signs assessment to between two and three first-year undergraduate nursing students in dyads under the direct supervision of academic staff. The pedagogical approach of pairing teachers in the near-peer teaching preparation and teaching session was used with the view of providing support and enhancing the peer teachers' confidence.

2.3. Sample

A purposive sample of the 393 third-year undergraduate nursing students involved in the teaching program from the four campuses at an Australian university was invited to participate in the study. Of the 393, 305 students completed the survey resulting in a response rate of 76%. Also, 14 students volunteered and consented to participate in the semi-structured interviews.

2.4. Data collection

The study explored the self-regulatory strategies used by students in both their approaches to their learning and study and practical teaching session, requiring data representative of these approaches at the end of the semester in which the teaching unit was conducted. The researcher contacted the unit coordinator on each campus at the study university to inform them of the study and sought their support in inviting their students to participate in completing the survey and participate in an interview immediately following their near-peer teaching session.

A validated instrument, the Motivational Strategy Learning Questionnaire (MSLQ), developed by Pintrich and colleagues was used to measure the self-regulatory behaviours and strategies employed by students (Pintrich et al., 1991). The MSLQ was chosen for this study because it reliably measures the 15 scales of Pintrich's social cognitive model of SRL (Pintrich, 2000). The MSLQ is a self-report instrument with 81 items using a seven-point Likert scale (1 = not at all true of me; 7 = very true of me). Surveys were distributed and collected by the first author.

Semi-structured audio-recorded interviews lasting 20–40 min were conducted on the campus of the university. An analysis protocol was used in the qualitative component of the study, a theory-guided approach, as described by Winne and Perry (2000), using question prompts linked to theoretical categories of SRL. In line with the convergent approach of mixed methods design, the theory-guided approach to the interviews converged with theoretical constructs of the MSLQ (Table 1). Although guided questions were used students were concurrently allowed to elaborate on the questions to further generate verbal descriptions (Winne and Perry, 2000).

2.5. Data analysis

Quantitative data analysis was performed using Statistical Package for Social Science (SPSS), version 24 (IBM Corp., 2015). All negatively-worded items were reverse-coded to ensure all questions accurately represented higher scores in the MSLQ scales. To determine the degree and strength of relationships between MSLQ scales, a correlation coefficient using Spearman's rho, a non-parametric rank statistic, was used. Strength of relationship was determined using Cohen's guidelines of r = 0.1 to 0.29; medium r = 0.30 to 0.49; large r = 0.50 to 1.0 (Cohen, 1988).

Cronbach alpha coefficient was used to assess for internal

Table 1
Interview questions.

INTERVIEW QUESTIONS	SELF-REGULATORY BEHAVIOURS
1. What were you hoping to achieve as a teacher?	Value component; task value, goal orientation.
1a) Did you achieve this? If not, what would you do differently?	Expectancy component; self-efficacy and affect.
	Cognitive and metacognitive; critical thinking, rehearsal.
	Resource management; peer-learning, help-seeking.
2. What does it mean to you to teach a peer?	Value component; task value, goal orientation.
	Expectancy component; self-efficacy and affect.
3. Tell me, how you make the transition from learner to a teacher role?	Value component; task value, goal orientation.
3a). How did you prepare for this transition?	Expectancy component; self-efficacy, affect.
	Cognitive and metacognitive; critical thinking.
	Metacognitive self-regulation.
	Resource management; strategies and help-seeking.
4. How did you prepare for the session?	Cognitive and Metacognitive strategies; rehearsal, critical thinking, metacognitive self-regulation.
	Resource management; peer-learning and help-seeking.
5. Overall, how do you think the session went?	Expectant component; self efficacy, affect.
5a) Is there anything you would do differently.	Cognitive and Metacognitive strategies; rehearsal, critical thinking, metacognitive self-regulation.
	Resource management; peer-learning and help-seeking.
6. Was there a moment when you thought the teaching session was not going so well? If so, what happened and what did you do?	Expectant component; self-efficacy, affect.
	Cognitive and Metacognitive strategies; critical thinking.
	Resource management; peer-learning and help-seeking.
7. What factors do you believe had the most influenced on how you performed as a teacher? Why do you say that?	Expectancy component; Self-efficacy, affect.
	Cognitive and Metacognitive; Critical thinking.
	Resource management; peer-learning and help-seeking.
8. Did you have any concerns about your teaching role? If so, what were your concerns and how did you manage them?	Expectancy component; Self-efficacy, affect.
	Cognitive and Metacognitive; strategies-critical thinking.
	Resource management; peer-learning and help-seeking.
9. Overall how do you think your learners performed? Why was it like that?	Expectancy component; self-efficacy, affect.
	Cognitive and Metacognitive; critical thinking.
10. How has the teaching experience impacted on your confidence to teach in the future? Why do you say that?	Expectant component; self-efficacy, affect.
	Cognitive and Metacognitive; Critical thinking
11. Is there anything else you would like to tell me about your experience as a teacher?	

consistency of the scales on the MSLQ compared to the coefficient validation reported by Pintrich et al. (1991). Items comprising more than four items being expected to be within the acceptable alpha range of ≥ 0.7 (DeVellis, 2012). For scales with four or less items (intrinsic and extrinsic goal orientation, control of learning, rehearsal, organisation, peer learning and help-seeking), the mean inter-item correlation was reported using an optimal range of alpha of .2–0.4, in accordance with the recommended criteria of Briggs and Cheek (1986). Internal consistencies of most scales on the MSLQ reported in this study demonstrate a good relationship between each scale, similar to that reported by Pintrich et al. (1991). Overall, results indicate the coefficient validation conducted by Pintrich et al. (1991) remains valid for the undergraduate nursing students involved in this study.

Interviews were transcribed verbatim and entered into NVivo 8 (QSR International Pty Ltd., 2012). Major categories were developed a priori from the conceptual framework of Pintrich (top-down) and subcategories from an interactive process involving bottom-up (from the data) and top-down approaches (theory). Aligning transcripts with the audio-recordings in NVivo provided another opportunity for the researcher to re-check transcript accuracy during the coding process. Each transcript was given a unique identifier to enable linkage between interview transcripts, audio-recordings and field notes. In accordance with a theory-guided convergent approach, data were classified with nursing students' descriptions of self-regulatory strategies and behaviours. Table 2 details the process undertaken for the analysis.

A member of the research team assisted the lead researcher through analytical probing to uncover any biases, perspectives and assumptions. In line with expert reports highlighting problems associated with nursing students establishing the validity of qualitative research (Angen, 2000; Morse, 1994; Sandelowski, 1993), data checking by the nursing students was not undertaken in this study. This process relies on the assumption that there is a fixed truth of reality, and in addition, due to the theoretical nature of the data analysis it was viewed that students may struggle with abstract synthesis of the theoretical underpinnings of SRL.

2.6. Ethical consideration

Ethical approval was obtained from the university's Human Research Ethics Committee. Prior to recruitment, the nursing students received information on the study, in terms of its purpose, procedures involved, and the fact that anonymity and confidentiality was guaranteed. They were further informed that participation would be voluntary. If a student completed and returned the questionnaire, it was considered informed consent to participate in the survey component of the study and written consent was obtained for the interviews.

3. Findings

3.1. Quantitative results

Of the 393 potential participants, 305 completed the survey resulting in a total response rate of 76%. Five surveys were excluded, as they contained missing values of more than 10% from either missed section or missing values consecutively (Bennett, 2001). Responses from the remaining 300 nursing students included 113 incidences of missing values for individual questions in the MSLQ. Little's MCAR test (Little, 1988) confirmed these to be missing completely at random (chi-square = 1698.22, df = 1636, $p = 0.139$) and missing values were imputed using an expectation maximisation (EM) method utilizing same component scales to inform imputation (Newman, 2014).

The majority of participants were aged 25 years or less (71%). Most were female (92%), which is consistent with the broader nursing profession, as reported by the Australian Bureau of Statistics (ABS, 2013) consisting of 90% (n = 276) females. The study was conducted over four campuses of the same university, with 54% of the students located

Table 2
Process of qualitative data analysis.

Process	Details
First level exploration of data and relating it to SRL theory.	Importing transcripts and audio recording into NVivo 8. Reviewing raw data, reading and re- reading transcripts and listening to the audio-recorded videos. First level exploration of data to theory. Transcripts checked by second researcher
Exploring the relationship of data to the research question and theory of SRL	Making notes in NVivo of definitions of Pintrich's SRL categories and sub-categories
Examining in depth the relationship of the evidence to the theory	Creating nodes and sub-nodes aligned with SRL sub-categories from interview questions. Colour coding nodes
Examining relationships between and among the codes and summaries of the data	Reading the colour-coded narratives and rebuilding and re-arranging narrative and coded categories
Relating the relationship of code summaries to theory other contexts and literature of importance	Re-checking by a second researcher of codes against Pintrich's definitions of sub-categories of SRL. Researching theory of categories not part of the theory of SRL
Exploring relationships of all the pieces of narrative.	Merging the two sets of data, synthesising information, checking by two researchers, reviewing and resolving differences in evidence, into an interesting and informative manuscript

at a metropolitan campus, 20% and 15% at two outer metropolitan campuses and 11% at a rural campus.

Initial assumption testing for parametric analysis was performed on continuous variables (15 components of the MSLQ). The Shapiro-Wilk test was used to determine normality using a *p*-value greater than0.05, indicative of a non-significant result, and hence normal distribution. The only scales that did not violate the assumption of normality were time/study environment ($p = 0.189$) and self-efficacy ($p = 0.399$). Because of violations of normality, non-parametric testing was used for inferential statistical analysis. Therefore, medians and IQRs were used to report data, with alpha level set at 0.05.

Overall, the nursing students had high median scores for all motivation and learning strategy use. High motivational behaviours were observed with median scores of 5.0 and above for intrinsic and extrinsic goal orientation task value, control of learning beliefs and self-efficacy. For learning strategies, elaboration ($Md = 5.17$, IQR = 1.17), organisation, ($Md = 5.0$, IQR = 1.50) and help seeking ($Md = 5.0$, IQR = 1.25) were used the most.

To determine the degree and strength of relationship between MSLQ scales, non-parametric Spearman's rank correlation coefficient was used. Table 3 outlines the correlation analysis of the scales. Two-tailed Spearman's *rho* was used to assess correlations at 1% and 5% significance levels.

Significant positive correlation was evident in the majority of the MSLQ scales at a significance level of 1%. Associations between the majority of motivational scales inclusive of intrinsic goal orientation, task value, self-efficacy, and control of learning beliefs were also significantly positively correlated, with only one significant negative correlation, anxiety, which was significantly and negatively correlated with self-efficacy. Associations between the majority of cognitive and metacognitive and resource management learning strategy scales were also significantly positively correlated at $p < 0.01$. Motivational behaviours were significantly and positively correlated with most learning strategies, including higher order strategies such as elaboration, critical thinking and metacognitive strategies at $p < 0.01$.

3.2. Qualitative results

Students participating in the interviews were all enrolled in the teaching unit, aged between 21 and 26 years, two were male and 12 females from two of the university campuses. Table 4 details categories and subcategories extrapolated from the data. Three main categories were identified and six sub-categories under the heading of motivational behaviours including intrinsic goal orientation, extrinsic goal orientation, task value, self-efficacy, anxiety, self-doubt and beliefs about teaching. Two main categories and three sub-categories under cognitive and metacognitive learning strategies which evolved from the data were rehearsal, critical thinking, and metacognitive self-regulation, including shared regulation. Peer learning, (students learning from each other) and help seeking (seeking help from peers or others) was identified as a subcategory of resource management.

Motivational strategies were inherent in students' narratives and included both value and expectancy components. Motivation included a value component comprising intrinsic goal orientation (a focus on learning and mastery), extrinsic goal orientation, (focus on assessment outcomes and approval from others) and task value. Goal orientation and task value were categories identified in the students' narratives.

> *…it's like any kind of teaching experience, it helps you to consolidate.* (Martin)

The value of learning to teach was thought to be beneficial for future teaching roles in the clinical setting, once participants graduated.

> *It's important for me to be a good peer teacher because I want to be good at it in my career as well. I'd like to continue educating people that come to the ward.* (Irene)

Self-efficacy, or belief held by participants that they perceived themselves capable of teaching a peer, was not reported by the NPT as being present before the teaching session. However, students like Susie reported gaining confidence, and a sense she could succeed in the future as a teacher because of the teaching opportunity.

> *I was always nervous about … how am I going to teach them these things? Hopefully, I'll feel more comfortable having a student by my side, to teach them the skills, because I didn't realise how much I actually did know. It made me feel more confident.* (Susie)

Beliefs about teaching were beliefs including attributes expected of a teacher and how a teacher should perform to enhance learners' performance.

> *We have been taught by medical students, so I sort of knew what I would have liked because I've had that experience and it probably wasn't the best experience. I think that's just because they weren't prepared … I just think that our teacher (a nursing student) would have been able to teach us maybe hints and tricks. They [medical students] were sort of more like, you just have to practise and you'll get it.* (Ann)

Affective behaviours such as anxiety and self-doubt were inherent in students' narratives. Anxiety was manifested in several ways, such as anticipation of having to do the teaching and feeling unprepared. However, these behaviours were dissipated by the actual teaching, as narrated by Simon.

> *It was not as dreadful as I thought it would be. It wasn't as bad at least. I felt like it's another one of those things that at least I got a bit more experience from that. So, in the future if I need to teach I can draw from it and it hasn't put me off as much as I thought it would.* (Simon)

Table 3
Spearman's *rho* correlations amongst the MSLQ scales.

Components	Motivation					Learning Strategies								
	Value			Expectancy		Affect	Cognitive and Metacognitive					Resource Management			
MSLQ Scales	Intrinsic Goal Orientation	Extrinsic Goal Orientation	Task Value	Control of Learning	Self-Efficacy	Test Anxiety	Rehearsal	Elaboration	Organisation	Critical Thinking	Metacognitive Self-Regulation	Time and Study Environment	Effort regulation	Peer Learning	Help Seeking
Intrinsic Goal Orientation		.24**	.48**	.32**	.50**	0.01	.38**	.45**	.36**	.45**	.48**	.33**	0.04	.30**	.30**
Extrinsic Goal Orientation			.30**	.32**	.34**	.25**	.23**	.27**	.26**	.22**	.27**	.24**	.25**	0.09	.24**
Task Value				.32**	.34**	0.08	.33**	.46**	.39**	.37**	.33**	.31**	.11*	.22**	.30**
Control Learning					.29**	.15**	.16**	.29**	.17**	.12*	.22**	.18**	.17**	0.09	.19**
Self-Efficacy						-.12*	.30**	.37**	.33**	.37**	.31**	.26**	0.02	.23**	.24**
Test Anxiety							0.06	−0.02	−0.01	0.01	0.10	0.08	.18**	0.07	0.08
Rehearsal								.5 5**	.59**	.53**	.58**	.30**	0.09	.40**	.38**
Elaboration									.64**	.59**	.60**	.42**	0.09	.31**	.39**
Organisation										.53**	.63**	.37**	0.06	.37**	.37**
Critical Thinking											.63**	.40**	.17**	.42**	.37**
Metacognitive Self-Regulation												.47**	.20**	.39**	.48**
Time and Study Environment													.25**	.22**	.34**
Effort Regulation														.12*	.18**
Peer Learning															.50**
Help Seeking															

Table 4
Categories and sub-categories of motivation and learning strategies used to teach peers.

Category	Sub-category
Motivational behaviours	
Value components	Goal orientation:(Intrinsic/extrinsic) Task value
Expectancy components	Self-efficacy/confidence Beliefs about teaching
Affective components	Anxiety/Concern Self-doubt
Learning strategies	
Cognitive and metacognitive strategies	Rehearsal Critical thinking Metacognitive self-regulation (planning, monitoring and regulating) and shared regulation
Resource management	Peer-learning, Help-seeking

Self-doubt was reported by all NPTs. It manifested in doubting their abilities, and having no prior experience, creating uncertainty about how they would be received by learners. Anita reported doubting her ability to the extent that she avoided checking with learners to see how the session went.

> *We were just thinking, are they listening to us? Is this going in? Are we doing a good job? After the session we were thinking we didn't do very well. But then I don't really know, I never asked any of the students how it went.* (Anita)

Nursing students in this study reported using cognitive and metacognitive strategies such as rehearsal, critical thinking and metacognitive self-regulation (planning, monitoring and regulating cognition). In addition, shared regulation between paired teachers and between the teachers and learners was evident. Teachers also reported using resource management strategies of peer-learning.

Reflection, a component of critical thinking, was a captivating aspect of students' reported practices. They reported using past knowledge and experiences to guide their approaches to teaching peers. Their reflections enabled them to consider ideas for future teaching opportunities.

> *I suppose it (approach to teaching) came with time with experience and thinking about things that I've been taught and applying them to people I'm teaching. So just a lot of reminiscing and a lot of reflecting on things that I've gotten wrong. Things that I've seen other people do and things that I've been told. I feel like that sort of helped me prepare for teaching. It's essentially thinking about what's happened to me.* (Martin)

April used strategies, including planning, monitoring and regulating her teaching as well as rehearsal and peer-learning to ensure learners were taught well.

> *We knew the content first and we were totally okay to teach it. I mean even like just an hour before we came in for it (to teach) I got the two other peer teachers to sit across from me and I taught it to them, to make sure that I could actually say the content to make it sound like I've been doing this for years and to make sure we know our stuff. It can even help pick up things that are missed and things you need to do better. Then we did it great in the actual session.* (April)

Planning was an integral part of the NPTs' preparation. In the following exemplar, Hazel highlights planning and other regulatory strategies such as rehearsal and monitoring she used to teach a peer.

> *We did all the session plans, we prepared a clinical work instruction and developed methodical steps, exactly how to take a blood pressure. We made a crossword and a quiz that we gave to them before and after just to compare. Then, before the session we met for an hour and discussed how we were going to go through everything, who was going to say what,*

and we did a little mock scenario. I think we did quite well. I think we stuck to the structure of what we'd planned quite well but also allowed for questions and queries. (Hazel)

Seeking help from peers was anticipated by Irene.

If I saw blank faces and I was finished with what I was saying [in the session], I was kind of hoping that my buddy would pick up and start talking about that subject. (Irene)

Students highlighted advantages of working as dyadic peer teachers in the development of a session plan, rehearsing, executing the plan, seeking help from each other and shared-regulation, as highlighted by Susie.

Having that guide [session plan] was really useful so we would know what to talk about next, the teaching plan. Having my partner there as well. That was good too. If I thought I couldn't explain something in much detail she could do it instead, or vice versa. (Susie)

4. Discussion

The purpose of this concurrent mixed methods study was to understand in depth the motivational and learning strategies used by undergraduate nursing students in their final year of a degree program, in both academic work and in the process of teaching junior peers. This is the first known study to explore self-regulatory behaviours of undergraduate nursing students in two different contexts concurrently that is, nursing students' approaches to academic work and as they teach a peer a procedural skill.

A significant finding of this study in both the qualitative and quantitative data is the extent of high use of motivational and learning strategies of undergraduate nursing students. This finding supports the principle components of SRL and provides further support for the theory (Pintrich, 2004). Students' positive motivational behaviours such as high self-efficacy, task value, intrinsic goal orientation and high use of learning strategies such as cognitive, metacognitive and resource management strategies use were evident in the quantitative data, and in valuable descriptions from interview data. This finding is in line with the theory of SRL suggesting that academically efficacious students not only monitor and regulate their learning more closely, they make greater use of learning strategies than less efficacious students (Pintrich and Schrauben, 1992). This current study identified association between high self-efficacy and high use of learning strategies. The significance of these findings is that students' high strategy use is known to be associated with high use of self-directed learning strategies (Zimmerman and Martinez-Pons, 1990), which is an integral part of lifelong learning, and a core requirement of the nursing profession. Graduate nurses enter a healthcare sector which is rapidly changing and expanding and knowledge-intensive, to meet the demands associated with the complexities in health care nursing students must have high levels of motivational and SRL behaviours.

Given students were enrolled in their final unit and obtaining registration to enter the workforce was in part dependent upon them passing the teaching unit, it is logical that these students would be highly motivated to perform well. In addition, they saw the value of near-peer teaching as a vehicle for improved confidence to teach, preparing them to teach in clinical practice once they graduated. The importance of formally preparing nursing students to teach once they graduate was identified in a study exploring the teaching activities of newly graduate nurse (McKenna et al., 2018).

Aligning with the theory of self-efficacy (Bandura, 1977) and SRL (Pintrich, 2004), anxiety was significantly negatively correlated; albeit at a low level, with self-efficacy and higher self-efficacy was associated with lower anxiety. This association between anxiety and self-efficacy was highlighted in both the survey data and qualitative reports. Student narratives featured the transforming of confidence during the teaching session once they felt less anxious about teaching. A divergence from the theory of SRL, self-doubt a component of anxiety, emerged in the students' narratives.

Learning to teach was a new challenge for the NPTs in this study and unfamiliar or challenging situations can be associated with high anxiety (Fereday and Muir-Cochrane, 2006). One possible explanation for students' reported inabilities to moderate behaviours, such as lower self-efficacy, self-doubt and anxiety prior to the teaching session, could be the educator's focus on cognition taking precedence over the learning of affective behaviours. Bastable and Doody (2010) posit that focus on cognition results in lack of opportunity for the educator to attend to students' negative affective behaviours or for students to express such behaviours. Discounting the importance of addressing negative affective behaviours has implications for students' performance and course progression.

The manner in which the quantitative and qualitative findings highlighted higher-order or deep processing learning strategies, such as critical thinking, metacognitive self-regulation indicate the degree to which these students will have the capacity to problem solve complex situations in the clinical setting once they graduate (Kuiper and Pesut, 2004; Chen et al., 2019). Regulation of metacognition and critical thinking was found to be quantitatively high and featured strongly in the qualitative findings. This indicates that participants in the present study were focused and approached their academic work and the teaching task by questioning knowledge, searching for evidence, reflecting, monitoring and regulating their learning and performance as teachers.

Peer-learning and help-seeking are learning strategies known to enhance learning and performance (Pintrich, 2004), and indicate students' abilities to identify something they do not understand and to seek help, or elect to work with another, such as a peer. These learning strategies were evident in the quantitative data and supported by students' narratives, where use of dyads for the practical teaching session was instrumental in these students using help-seeking and peer-learning strategies effectively. This was evident in how they described sharing agreed goals, helping each other to create the teaching session, supporting each other during the session and learning from each other in the process.

Students working in dyads provided a supportive environment, enhancing their self-efficacy and shared regulation. According to Liskala et al. (2011), this finding is an example of how metacognitive experiences trigger socially shared metacognition. The significance of this maturation of metacognitive growth is the influence it has on developing self-directed, long-life learners (Lajoie and Lu, 2012). Paired peer teaching in this study provided a unique opportunity for NPTs to receive assistance and support from their peer partners, thereby providing a more positive perception of the teaching experience and ultimately less task-related anxiety. This is supported by another study of undergraduate psychology students which found that students working in structured dyads experienced lower psychological distress, greater course satisfaction and better performance in examinations (Fantuzzo et al., 1992).

4.1. Limitations of the study

This study has several limitations that call for caution when interpreting the results. Although using mixed methods provides greater depth to understand the problem under study, providing a clear integration of findings from disparate methodologies presents greater challenges than is associated with the individual methodology. In the current study the researchers attempted to integrate the findings; however, some of the themes identified in the qualitative data were not related to the survey's findings. This did not detract from the overall intent of the method which was to merge the data where possible to provide a greater understanding of the SRL strategies used by undergraduate nursing students use as they learn to teach. Findings relied

extensively on self-reported data from both questionnaires and interviews; therefore, some responses may be reflective of desirable responses rather than actual practices. A further limitation is generalisability; the sample may not be representative of the wider population of nursing students, because the study involved only one university and one type of teaching program.

5. Conclusion

This is the first study in nursing to highlight the importance of active learning related to SRL in the context of peer-teaching in undergraduate nurse education and has implications for the broader curriculum in health professional education. The relevance of this finding lies in fostering active, efficacious and self-directed learners in undergraduate teaching programs preparing them as teachers in the clinical setting. Hence, the study has highlighted a need for teaching to be included in national standards for undergraduate nursing curricula to support students in their roles as teachers once they graduate.

The findings identify how a dyadic approach in peer teaching can support metacognitive-shared regulation and how self-doubt may affect NPTs' performance. Therefore, both concepts, self-doubt and dyadic teaching, ought to be included within the conceptual framework of peer teaching. In addition, the theory of SRL could be expanded to include self-doubt as a possible negative influence on motivational behaviours and strategy use. Future studies should make use of other data sources, such as real-time studies and verbal protocols, and the use of a micro-analytic method may be an effective means of capturing SRL processes during near-peer teaching.

Ethical approval

Monash University Research Ethics Committee CF09/776-2009000321

Funding sources

None.

Declaration of competing interest

Nil to declare.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.nepr.2019.102633.

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