Accepted refereed manuscript of:

James B, Beattie M, Shepherd A, Armstrong L & Wilkinson JE (2016) Time, fear and transformation: Student nurses' experiences of doing a practicum (quality improvement project) in practice, *Nurse Education in Practice*, 19, 99. 70-78.

DOI: 10.1016/j.nepr.2016.05.004

TIME, FEAR AND TRANSFORMATION: STUDENT NURSES' EXPERIENCES OF *DOING* A PRACTICUM (QUALITY IMPROVEMENT PROJECT) IN PRACTICE

ABSTRACT

Background: Improving and sustaining quality in healthcare continues to be a global challenge, resulting in the necessity of developing quality improvement (QI) skills and knowledge to use in practice. This paper reports student nurses' experiences of conducting a quality improvement project (Practicum) as a compulsory assessment whilst on clinical placement areas across Scotland. Methods: Telephone and face-to-face interviews (n=18) were conducted using a semi-structured interview schedule. Discussions were transcribed verbatim and data were analysed thematically. Data were extracted from Practicum assignments (n=50). Results: Three key themes emerged from the analysis: 1) Time; students highlighted the necessity of time in practice areas to acclimatise, socialise and conduct the Practicum. Timing of the Practicum within the curriculum was also important. 2) Fear; was experienced by many students at the perceived enormity of the assignment, the bravery needed to attempt to change practice and the adjustment to a unique type of assignment. 3) Transformation; students shared their shifted perceptions on completing a Practicum, including a sense of achievement and acknowledgement of key improvement skills for the future. Conclusions: Student nurses need to be stretched beyond their comfort zones to rise to the challenge of the Practicum, whilst ensuring adequate support mechanisms are in place from a range of sources.

Keywords: quality improvement, curriculum, change, practice learning, clinical placement, qualitative interviews, thematic analysis

INTRODUCTION

Improving and sustaining quality in healthcare continues to be an intractable challenge. This has accelerated the necessity to apply quality improvement (QI) methods in clinical practice. Despite international policy documents advocating 'QI education for all' little has translated into the undergraduate nurse curriculum (Institute of Medicine 2001; Department of Health 2008; Scottish Government 2010). Yet, revised guidance on professional standards for nurses make direct reference to the requirement of improvement and safety skills (NMC 2015).

BACKGROUND

Quality improvement can be defined as the planned interaction between technical/rational approaches to change and the social psychology of change in order to achieve better processes/outcomes for a person (or persons) engaging with health services (James 2014). Whilst there are an array of QI educational resources, such as the e-learning modules at the Institute for Healthcare Improvement (IHI), World Health Organisation (WHO) Multi-Professional Patient Safety Curriculum Guide, the 1000 Lives campaign and the Quality Improvement Hub (IHI 2013, WHO 2011, NHS Education Scotland 2012, NHS Wales 2013) implementation into the nursing curriculum has been slow, with the exception of some pockets of innovation (Rooney and Beattie, 2012).

The educational theory of quality improvement learning is compatible with the philosophical assumptions of constructivism; the belief is that the engagement of students in active, as opposed to passive, learning processes will translate knowledge more effectively from theory into practice (Thomas, 2007). QI is an action-orientated approach to

change which requires students to be active participants in the learning process. Whilst some educational initiatives focus on technical aspects of QI, such as PDSA cycles, process mapping, run charts, others focus on the psychosocial aspects of change. Our theoretical underpinning of QI learning is that both technical and psychosocial skills are essential, and improvements are achieved by the interaction of both aspects. Engagement of people in the change process can be achieved by using various QI tools and vice versa. Yet, most of QI curriculum in undergraduate provision does little to facilitate experience in these interactions.

Jones et al. (2013) describe the extensive quality improvement curriculum content of an undergraduate nursing programme in Wales, but emphasise that students are not required to conduct a QI project due to resource limitations and impracticalities in clinical placements. In programmes where QI projects in practice have been available to students, it has been for selected subgroups, as opposed to QI for all. For example, Baillie et al. (2014) reported the introduction of a QI dissertation to pre-registration students, but the intervention was limited to a sub-group cohort of 46 degree level student nurses. Insufficient detail of the intervention was given to enable replication and testing in other educational institutions. The systematic review by Boonyasai et al. (2007) of QI educational interventions found that the only evaluation featuring nursing undergraduates involved a subgroup of students from a larger cohort (Kyrkjebo et al. 2001). There is a paucity of evidence in relation to students conducting QI projects in clinical practice. However, two systematic reviews are currently underway. Carson-Stevens et al. (2014) are looking at the outcomes of QI inter-professional healthcare education, whilst Armstrong et al. (2015) are evaluating QI teaching methods in nurse education.

Lack of implementation of quality improvement education is likely a result of the limited evidence around effective and feasible educational strategies. In summary, the evidence to date suggests a lack of theoretical development, scarce description of the QI educational interventions and limited evaluation of feasibility and effect. This study describes our QI educational intervention (Practicum) and the first steps of feasibility; reporting the students' experience of conducting a Practicum in clinical practice as an assessed component of their undergraduate nurse programme. It is part of our attempt to address the issues raised by Parry et al. (2013) concerning proper evaluation of improvement initiatives; in this case, an improvement to curriculum.

QI Curriculum Development

The Practicum is designed as an academic assignment suitable for all final year undergraduate student nurses to plan a quality improvement project and test aspects of it in clinical practice (University of Stirling 2016). Development of the Practicum has been thorough; a 20-month period of testing and extensively adapting the structure devised by the Institute for Health Care Improvement (IHI 2012). This process was conducted to fit our University assessment processes and practice placement framework and included trials with student volunteers. QI theoretical content is integrated throughout the curriculum to prepare the students to conduct the practicum in their penultimate module of their three-year General Degree programme (see Table 1 for the Quality Improvement Curriculum Content experienced by the 2011 cohort).

Insert Table 1: Quality Improvement Curriculum Content here

The Practicum was designed and implemented using quality improvement methods; multiple QI tools and techniques were used to engage and involve people (students, academics, clinicians and leaders) in the process (see Figure 1 Driver Diagram). A quality improvement working group (academic and clinical staff from across three Health Boards in Scotland) tested various aspects of the change. For example, we tested and adapted the location of Practicum material, finally housing it within the Universities Virtual Learning Environment (VLE) due to findings from students' tests using PDSA (Plan, Do, Study, Act) cycles. The IHI Practicum Assessment Form was adapted into a self-assessment for students (IHI use this form for faculty summative feedback), and we devised our own Practicum Guide. The Practicum requires students to devise and test various aspects of a full QI project, which would demonstrate QI knowledge and skills. The purpose of the Practicum is for students to learn QI, not necessarily demonstrate measureable improvements within a short time frame (although many have). See Table two for examples of student project titles.

Insert Figure ~~2~~ 1 here: Driver Diagram

Insert Table 2 here: Sample of Student Practicum Titles

Quality Improvement Project (Practicum)

In 2014, the School of Health Sciences at the University of Stirling, working in partnership with National Health Services (NHS) Boards, implemented a quality improvement Practicum for all final year student nurses (230) to conduct, within clinical placement areas across

three Health Board Regions. The students were spread across approximately 200 practice placement areas, covering a geographical area of approximately 29,000 square kilometres. Students had a seven week clinical placement, followed by 4 weeks in University to submit a 4,000 word report – in total, eleven weeks to undertake and report. Given the limitations of placement time the Practicum was designed to assess the students understanding of key aspects of improvement, as opposed to implementing a full QI project. Our definition of a Practicum is therefore a small scale improvement project, developed in clinical practice which comprises of four stages:

1. Identifying a project and obtaining agreement to it
2. Preparing a plan for the project (including a detailed measurement plan)
3. Testing an aspect of the project with at least two PDSA cycles
4. Writing a project summary report, including evaluation/reflection.

In this paper we share the experiences of the first cohort of student nurses to complete the Practicum.

AIM: To explore student nurses' experiences to provide evidence to inform the future design and delivery of a Practicum within undergraduate curricula in the UK and internationally. Specifically, the research question is "Is the practicum feasible from the students' perspective?"

RESEARCH DESIGN

Qualitative research has a synergy with nursing; as both are person-centred, holistic and have humanistic principles at their core (Parahoo 1997). Given that qualitative approaches

concern individual experience and perspectives this approach is conducive to our enquiry (Coates 2004). Nursing students' personal accounts and narratives have been used previously to gather data of their experience (East et al. 2010, Haigh and Hardy 2011). Semi-structured interviews, using open-ended questions, were used to standardise the interview process and elicit the students' experience. Interview schedules were designed to have a purposeful conversation about the students' experience while doing a practicum. Students' reflections, within their Practicum assignments, have also been used as sources for thematic analysis to make sense of their experience and associated decision-making (Naber et al 2014).

A purposeful stratified sample was identified (interviews n=18, assignments n=50) to ensure representation of student views across the three campuses, assignment grades and fields (see Table 3).

(Insert Table 3: Sampling Strategy)

Data Collection

Study information was advertised on the students' VLE and information sheets were e-mailed to those who responded as interested in participation. The invitation to participate was advertised after all assignment results had been finalised and published, to ensure there could be no perception that participation was in any way related to results attained. Students were selected for interview according to the criteria of the stratified sample, on a first come first served basis. Students were given a minimum of 48 hours between receipt of the information sheet and being interviewed, to allow for a change of mind. Written

consent was obtained. A semi-structured interview schedule was utilised and interviews took place either face-to-face or by telephone and were audio recorded (see Figure 2: Student Interview Schedule). The interviews were conducted by three researchers/ teachers and a Clinical Academic Fellow who would be undertaking a PhD researching the long term impact of the practicum. Whenever possible, interviews were conducted by an interviewer from a different campus to the student. Students were reminded to ensure confidentiality in responses, and were identified only by a research code. Interviews were then transcribed verbatim by an independent transcriber.

Insert Figure 2: Student Interview Schedule

Following dispersion of students' grades for the Practicum, we placed a notice on the student VLE and e-mailed students inviting then to opt out from the reflective component of their assignments being included in the analysis. Two students chose to do so, and their scripts were excluded.

Data Analysis

We conducted a thematic analysis of interview transcripts to identify key themes in relation to the students' experience of conducting a Practicum. Firstly, the transcripts were read by two researchers independently and individual themes were identified. Secondly, the research team met to discuss the findings of step one and extract collective data. Thirdly, all content was grouped under the key themes.

We used a data extraction tool to elicit relevant information from the assignments. We have devised a data extraction tool containing eight Quality Improvement Principles (QIP). It includes, for example, analysis of how Plan Do Study Act cycles are used (Taylor et al. 2013). For this study, the only data utilised was from sections on the students' personal learning and reflection.

Firstly, one researcher (BJ) analysed all 50 assignments, with two researchers (MB, AS) analysing a 10% random sample (five) each from the assignments and independently extracted data on students learning and personal reflections. Secondly, the team met to share and discuss their findings. During the discussion themes emerged between all three researchers' preliminary findings. Finally, data from the interview transcripts and all extracted data from assignment analysis were integrated into key themes.

Ethics

This study was reviewed and approved as a teaching evaluation by the Research Ethics Committee in the School of Health Sciences, University of Stirling.

RESULTS

Interviews ranged in length from 10 to 24 minutes, with an average of 14 minutes.

Time

Time was an important and recurring theme of the students' experience. The limitation of time in practice, as well as timing of quality improvement teaching, were highlighted by the students as impacting on their experience.

> "I think it was good that we had the first sessions back in… 'cause it gave us time over Christmas… to look at it and think about what I might want to…" (Student XD3)

Some students considered only the final preparation sessions as content relevant to the Practicum, despite almost two years of quality improvement curriculum content.

> "I remember thinking 'oh that's quite soon, I need to start working on that really, really soon,' maybe a bit more time in advance to … think about it and get your head around it..." (Student ZD51)

Students had seven weeks to conduct their Practicum within the clinical areas. Students expressed the desire for a 'settling in' period to get to know staff and the routine of the workload before being able to initiate their Practicum.

> "…by the time you feel comfortable and get used to your setting and everything and then you're having to, to do this on top of it was quite difficult" (Student XD1)

> "Time constraints, and … when you are on ward for the first time it's nice to get the dynamics of the ward and the routine of the ward or the placement…" (Student ZC17)

Due to the time limitations, we recommended students should identify a suitable topic within the first two weeks of placement. Many students expressed concerns over the initial challenge of choosing a project.

> "…it was hard choosing a project." (Student ZD8)

> "Choosing what to do for the project was the hardest bit… (Student XD63)

Students experienced a constant balancing act between work on achieving clinical competencies and doing the Practicum. Students viewed these as two separate aspects of practice.

> "… it was difficult because we were on placement, and you're trying to, you know you're trying to gain practical skills while you're on placement, and that's what you want to concentrate on, and then having to do that on top of it, yes, it can be quite difficult…" (Student YD6)

> "…so literally for the first two weeks it was trying to get to know your mentor, get to know your patients, what kind of work you're meant to be doing, and because it's like your penultimate placement, before management, you're trying to get as much experience as you can, so it was quite hard trying to run the practicum as well." (Student XC1)

Fear

Many students experienced fear, daunted by the perceived enormity of the assignment, the bravery needed to attempt to change practice and the adjustment to a unique type of assignment. There was also panic in relation to understanding and application of some tools and techniques.

> "…especially process, outcome and balancing measures, that threw me completely. And I think a two hour lecture with…a question and answer thing before he had even done his lecture wasn't very fair on us. That kinda put us in a panic mode…what are they talking about?" (Student ZC17)

> "The Excel documents we had to use for the run charts…and the Pareto Chart, they were an absolute nightmare…" (Student XD3)

> "…'cause ….. was trying his best to be able to make it clear for us, but when you haven't dealt with any of these words…that scared us…" (Student ZC17)

There were initial fears about potential projects being, effectively, criticisms of practice;

> "…it takes confidence to discuss QI in an unknown team, as it seems like questioning their practice…" (Student ZC1 Script)

> "…making a change is daunting as a student…" (Student ZD21 Script)

Transformation

Yet students' perceptions shifted on completing a Practicum, including a sense of achievement and acknowledgement of key improvement skills for the future. Fear and anxiety seemed to be managed by the highly structured nature of the assignment and other support mechanisms.

> "…the sessions that……arranged were really, really helpful…'cause you know that there was somebody there that you could go to if you had any sort of issue at all." (Student ZC4)

> "…your very fast response to panicky emails…" (Student XD1)

The Practicum submission was composed of many blank templates which the students needed to populate. For example a blank practicum plan contained sections for the aim, justification, measurement plan, etc. which the students were required to populate with detail of their particular Practicum. The highly structured layout of the Practicum appeared to provide a helpful support mechanism.

> "I think it was really good, the documentation that was provided was 'cause it gave a really clear guide on what we actually had to do, so I wasn't confused about what I had to do…" (Student ZD39)

> "I quite liked that everything was structured to give you a point of where to go next…" (Student XD4)

> "The procedurally evolving nature of this project was helpful for engaging in a QI project for the first time. The hand-holding nature of the paperwork such as the project plan and the PDSA cycles meant that it was hard to feel overwhelmed or lost in the process." (Student ZC26 Script)

We provided a student exemplar of a completed Practicum to demonstrate what we were looking for in their assignment submissions.

> "Well obviously the mock example was like the bible, it was really, really useful. 'Cause I knew how to fill out a PDSA cycle and all that, but it was kinda putting the whole project together that I struggled with, and the mock essay really, really helped." (Student ZD8)

> "…the practice one that we got I think really helped…you got to see an example of what someone else had done and I think that was the thing that I most benefitted from." (Student ZD39)

The students also experienced overwhelming support within the clinical areas. Students were supported even within areas with no apparent quality improvement knowledge.

> "The main factor in the success of this practicum was my placement mentor…no previous quality improvement knowledge…three others were early innovators and their keenness and ability to guide change was an energizer…" (Student ZC13 Script)

> "The staff were extremely keen to try my ideas and I do not believe the project would have been successful without them." (Student ZD32 Script).

Once students had managed the restriction of limited time and anxieties about making a change, completing the practicum enabled transformative change. Students thinking evolved and they seemed to have more awareness of patients' needs, the use of quality improvement tools/ techniques, the need to engage others in the process, an awareness of personal achievement being possible and a commitment to use QI again in future practice.

Students demonstrated the ability to take responsibility for improvement in clinical practice.

> "Making a change will not happen unless someone takes the initiative…I have learnt that what you might predict is going to happen when you implement your change is often not what happens…I have learnt that staff are willing to change if you get them involved with making the change." (Student XD40 Script)

> "…small changes can make a big difference to a patient's experience and the care they receive... Previous to starting this project I was unaware of how as a student I could help to achieve change…" (Student ZD21)

They also confirmed our belief of how quality improvement gets done – using tools and techniques to engage people, and vice versa.

> "When organizing and planning my PDSAs it was quickly realised that the achievement of the cycle strongly depended on the participation of all the staff members on the ward… QI has to be a team effort". (Student ZC6 Script)

> "…it certainly made you think about the process of making a change in healthcare…you really need to get the team involved and get their feedback…it was hard, very hard…it was actually really good, although it was really difficult…" (Student XD1)

Students who had previously feared the assignment began to realise how these skills would help them in future clinical practice.

> "…staff getting on board can be a demanding task. However, staff thrived during the project… invaluable for my current practice and my later professional career." (Student XD6 Script)

> "I have learnt that I have a new motivation for QI. Although this project was difficult to implement as student, it is something I will take seriously as a staff nurse and I will not shy away from taking something like this on again…Frontline staff are being given permission to make changes and we need to take it." (Student ZD84 Script)

Students were proud of what they had achieved during the Practicum; that their hard work had paid off.

"I'm glad I had the opportunity to do it, at the time I thought it was too much…only to have a short space of time to try and change something. But now I've done it, I'm really glad I've done it, and I've got an interview tomorrow for a job and I'm going to speak about what I've done…" (Student ZC26)

"I learnt I didn't hate it as much as I thought I would…it does make a difference when you do these wee things…now it's all done and I've done it, and I've seen the difference it did make…it was worth it." (Student YD11)

DISCUSSION

This study described the experiences of student nurses conducting a small scale quality improvement project (Practicum) as a compulsory, assessed element of an undergraduate degree programme. Evaluation of the students' experience revealed that the Practicum was transformative in nature, enabling them to develop quality improvement skills. However, key aspects of fear and time required careful management.

Learning Theory

The learning did come at a potential personal cost, as students reported high levels of fear and anxiety during the practicum. The highly structured nature of the practicum assignment and support (online podcasts, exemplar, approachable and responsive academics) helped buffer the effects of the anxiety. Interestingly, the students' experience fits well with Senninger's theory of learning. Senninger (2000 cited in Eichsteller and Holthoff no date; NHS Institute for Innovation and Improvement 2007, p17) explains three distinct zones for

learning: a comfort zone which is largely familiar, where people do not change, or indeed learn; a discomfort zone, where people feel uncertainty and are most likely to learn; and finally the panic zone, where people are too fearful to learn or change. The Practicum as an academic assignment stretched people out of their comfort zone. Previously learnt skills which enabled students to pass assignments were not adequate for the demands of the practicum. Of course, it is important to prevent the panic zone, which some students appeared to have temporarily strayed into.

Anxiety, apprehension and fear describe the "starting position" for many students, related to a number of factors, with perhaps the time element being a continuous source of strain. It was this heightened state, however, which made students get started with the practicum and propelled them through the learning process. Once they had overcome their anxiety, the students had welcomed the opportunity to conduct an assignment based on proactive practice experience, rather than on retrospective analysis. The concept of a discomfort zone seems to resonate with another pedagogical social constructivist concept, the zone of proximal development, where complex learning is possible with guidance (Vygotsky 1978, p32). We believe the highly structured nature of the practicum and numerous support mechanisms buffered the ill effects for those who entered the panic zone and indeed enabled many to stay in the discomfort zone, enabling change and learning. The highly structured nature of the assignment and multiple support mechanisms seem to be necessary, and mutually supportive, components in enabling QI "assessment in action" to be a large scale, compulsory aspect of a programme.

The educational theory of constructivism seems to be supported by the observed and reported experiences of students. Although there had been a number of online quality and safety modules and supporting lectures throughout the curriculum, students seemed unaware of their previous QI learning, or 'unknown knowns.' An instructivist approach seems to have had little impact. We had predicted that students would not have absorbed much in the way of theory without a practice context. This finding was another "proof of concept"; quality improvement is a practice discipline, and it will not be absorbed in any significant depth in a classroom, from the internet or from a book or journal. It needs to be lived in a meaningful environment, with costs attached as well as benefits. The initial fear was provoked by a realisation of the possible costs, but it also provoked a great deal of work. The practicum assignment could be seen as creating a tension between social constructivism, the negotiated meaning of human interactions, and radical constructivism, the psychological processes by which individuals make meaning (Prawat and Floden 1994). Such tensions always exist; we merely made use of them.

Practice Implications

Unsurprisingly, students required a period of socialisation before they were able to get started with the practicum. It is largely supported in the literature that student nurses undergo a process of socialisation in clinical areas, and this process is essential for their development and future nursing career (Brown et al. 2013). The necessity to be accepted as a member of the team and acquire social knowledge is well documented (Hasson et al. 2012; Ward et al. 2012).

However, the work on the practicum seems to have mediated a different kind of relationship with qualified staff, one of greater depth and responsibility. Communication, enthusiasm, team work and support seem to have been a feature for most of the students' positive experiences. The worst that students faced from some clinical staff seems to have been a level of indifference. One of the potential benefits of involving student nurses in quality improvement while they are still students, is the potential for 'carry through' into their practice once they are qualified nurses. They bring with them far more than theoretical knowledge of QI; they also have the added value of practical experience of managing change, negotiation, leadership and other associated and important skills for nurses. As Senge et al. (1999, p569) point out, organizational change to fix deep problems will not be achieved by a few great leaders but by multiple actors with the confidence to address complex issues together.

Involving students in quality improvement has the potential to change attitudes as well as developing skills. It also has the potential to address some of the pitfalls of QI – either that it is seen as an additional activity rather than as core business, or it is seen as the responsibility of clinical governance or patient safety teams, rather than as everyone's responsibility (Wilkinson et al. 2011). In one study, Swedish nurses reported that remaining active in QI work had specific motivations attached to it, these being the ability to have an influence over clinical practice and ongoing development as a nurse (Wallin et al. 2002). We believe that these are also motivations for our students as they move forward in their nursing careers, having been involved in a culture that values the contributions of student nurses to quality improvement (Beckett et al. 2013).

The practicum was not viewed by students as an enabler for both the social penetration into practice and as a route for acquiring clinical skills. It is clear from reported experience, however, that the practicum enabled social integration and the demonstration of key competencies, yet these high level skills were seen as something different to the attainment of clinical skills. This is the same tension that exists in clinical practice, where quality improvement is largely viewed as an additional activity as opposed to being integrated with daily clinical business (Health Foundation, 2013). The problems of engaging clinical staff in QI are well recognised internationally, and the students faced entrenched problems common to many clinical areas (Wilkinson et al. 2011).

In practice areas, support came chiefly from the practice mentor and/or the charge nurse/senior nurse. For many students, but not all, support from the rest of the staff was also important. Apart from charge nurses, the presence of explicit quality improvement knowledge seemed to be the exception rather than the norm, but did not seem to be a decisive factor to students completing the practicum. The most important aspects of mentor support seemed to be facilitation, enthusiasm and mediation with other staff. This support by endorsement and positive attitude is a key feature of what constitutes good mentoring generally (Webb and Shakespeare 2008, Jokelainen et al. 2013) and supports the concept of trainees and junior staff as key catalysts for change proposed by Klaber and Roland (2013). This finding suggests that allowing student nurses to undertake a practicum does not put additional demands on mentors.

Strengths and limitations

To our knowledge, this is the first evaluation of undergraduate student nurses' experience of a quality improvement practicum for all. The qualitative exploration of the students' experience enabled us to understand the implications of the Practicum from the students' personal experience. Doing so provides evidence to improve our QI curriculum and inform the design and delivery of similar curriculum innovations internationally.

Whilst there remains the potential that students responses may have been influenced by their relationship with University staff we took all necessary steps to reduce the risk of gratitude bias, such as the inclusion of students whom had failed the assignment and interviewing students from different campuses where possible. Some of the frank responses suggest that students reported honest answers. As with all qualitative research our findings may not be generalisable to other students in different contexts; however we made every attempt to ensure the sample was representative of our student nurse population by ensuring those from different branches (adult and mental health nursing), locations (three difference campuses) and grades (including passes and fails) were proportionally represented.

CONCLUSION

The students' experiences suggest that *doing* a Practicum as a compulsory assignment in a large scale cohort is not only achievable, but possibly necessary to learn quality improvement skills. However, support is necessary to balance the risk between motivation to learn (discomfort zone) and fear (panic zone). We have sustained the practicum over three years resulting in approximately 750 student QI projects. The big question remains;

whether these insights into QI will be carried forward into practice by students when they become registered nurses. The least and the most we can say is that the odds must be considerably better following this assignment, as reported by the students themselves, than they were before it.

REFERENCES

Armstrong, L., Lauder, W. and Shepherd, A. (2015) An evaluation of methods used to teach quality improvement to undergraduate healthcare students to inform curriculum development within pre-registration nurse education. A protocol for systematic review and narrative synthesis. *Systematic Review,* 4; 8.

Baillie, L., Bromley, B., Walker, M., Jones, R. and Mhlanga, F. (2014) Implementing service improvements within pre-registration nursing education: A multi-method case study evaluation. *Nurse Education in Practice,* 14: 62-68.

Beckett, D., Inglis, M., Oswald, S., Thomson, E., Harley, W., Wilson, J., Lloyd, R. and Rooney, K. (2013) Reducing cardiac arrests in the acute admissions unit: a quality improvement journey. *BMJ Quality and Safety,* 2013;22:1025–1031.

Boonyasai, R., Windish, D., Chakraborti, C., Feldman, L., Rubin, H. and Bass, E. (2007) Effectiveness of teaching quality improvement to clinicians. *The Journal of the American Medical Association,* 298: 1023-37.

Brown, J., Stevens, J. and Kermode, S. (2013) Measuring student nurse professional socialisation: the development and implementation of a new instrument. *Nurse Education Today,* 33(6): 565-573.

Carson-Stevens, A., Mehta, G., Edwards, A. and Panesar, S. (2014) Evaluating the outcomes of quality improvement-focused inter-professional education for pre-registration healthcare professionals. PROSPERO, CRD42014006576.

Coates, V. (2004) Qualitative research: a source of evidence to inform nursing practice? *Journal of Diabetes Nursing*, 8; 329-334.

Department of Health (2008) High Quality Care for All: NHS Next Stage Review, Final Report, June.

East, L., Jackson, D., O'Brien, L. and Peter, K. (2010) Storytelling: an approach that can help to develop resilience. *Nurse Researcher,* 17(3): 17-25.

Eichsteller, G. and Holthoff, S. (no date) *Risk Competence: Towards a Pedagogic Conceptualisation of Risk.* Cumbria: ThemPra Social Pedagogy C.I.C. Available: http://thempra.com/downloads/risk.pdf [Accessed 11/01/15].

Hasson, F., McKenna, H. and Keeney S. (2013) A qualitative study exploring the impact of student nurses working part time as a health care assistant. *Nurse Education Today,* 33(8): 873-879.

Haigh, C. and Hardy, P. (2011) Tell me a story - a conceptual exploration of storytelling in healthcare education. *Nurse Education Today,* 31(4): 408-411.

Heath Foundation (2013) *Quality Improvement Made Simple*. London.

Institute for Healthcare Improvement (2012) *IHI Open School Quality Improvement Practicum.* Available: http://www.ihi.org/education/IHIOpenSchool/Courses/Pages/Practicum.aspx [Accessed 25/04/2016].

Institute for Healthcare Improvement (2013) *IHI Open School Homepage.* Available: http://www.ihi.org/Pages/default.aspx [Accessed 15/11/2014].

Institute of Medicine (2001) *Crossing the Quality Chasm: A new healthcare system for the 21st century.* Washington D.C.: National Academy Press.

James, B. (2014) Process mapping, Ch 8 **in** Bowie P, de Wet C (eds) *Safety and Improvement in Primary Care*, London: Radcliffe Publishing.

Jokelainen, M., Tossavainen, K., Jamookeeah, D. and Turunen, H. (2013) Seamless and committed collaboration as an essential factor in effective mentorship for nursing students: conceptions of Finnish and British mentors. *Nurse Education Today,* 33(5): 437-443.

Jones, A., Williams, A. and Carson-Stevens, A. (2013) Integrating quality improvement into pre-registration education. *Nursing Standard,* 27(29): 44-48.

Klaber, R. and Roland, D. (2014) Delivering quality improvement: the need to believe it is necessary. *Archives of Disease in Childhood,* 99: 175-179.

Kyrkjebo, J., Hanssen T. and Haugland, B. (2001) Introducing quality improvement to pre-qualification nursing students. *Quality in Health Care,* 10(4): 204-210.

Naber, J. L., Hall, J. and Schadler, C. M. (2014) Narrative thematic analysis of baccalaureate nursing students' reflections: critical thinking in the clinical context. *Journal of Nurse Education,* 53(S9): S90-6.

NHS Education Scotland (2012) *NHS Scotland Quality Improvement Hub.* Available: http://www.qihub.scot.nhs.uk/default.aspx [Accessed 08/12/14].

NHS Institute for Innovation and Improvement (NHS III) (2007) *Managing the human dimensions of change.* Coventry: NHS III.

NHS Wales (2013) *Homepage 1000 Lives +*. Available: http://www.1000livesplus.wales.nhs.uk/home [Accessed 14/11/14].

NMC (2015) *The Code.* London: Nursing and Midwifery Council.

Parahoo, K. (1997) *Nursing Research: Principles, Process and Issues.* London: Macmillan.

Parry, G., Carson-Stevens, A., Luff, D., McPherson, M. and Goldmann, D. (2013) Recommendations for Evaluation of Health Care Improvement Initiatives. *Methods in QI Research,* 13(6S): S23-S30.

Prawat, R. and Floden, R. (1994) Philosophical perspectives on contructivist views of learning. *Educational Psychology (USA),* 29(1): 37-48.

Rooney, K. and Beattie, M. (2012). Quality and Safety in Nurse Education: Are We in a State of Readiness? *Nurse Education Today,* 32(6): 622–623.

Scottish Government (2010) *The Healthcare Quality Strategy for NHS Scotland*. Edinburgh: Scottish Government.

Senge, P., Kleiner, A., Roberts, C., Cross, R., Roth, G. and Smith, B. (1999) *The Dance of Change: The Challenge of Sustaining Momentum in Learning Organisations.* USA: Doubleday.

Taylor, M., McNicholas, C., Nicolay, C., Darzi, A., Bell, D. and Reed, J. (2013) Systematic review of the application of the plan-do-study-act method to improve quality in healthcare. *BMJ Quality and Safety,* 2013; 0:1-9.

Thomas, G. (2007) *Education and Theory: Strangers in Paradigms.* Maidenhead: Open University Press.

University of Stirling (2016) QI Practicum presentation. Available: http://staff.stir.ac.uk/michelle.beattie/ [Accessed 26/04/16].

Vygotsky, L. (1978). *Mind in Society: The Development of Higher Psychological Processes.* Cambridge, Massachusetts: Harvard University Press. Reprinted in M. Gauvain and M. Cole (1997) *Readings on the Development of Children.* New York: W.H. Freeman and Company.

Wallin, L., Boström, A. M., Harvey, G., Wikblad, K. and Ewald U. (2002) Progress of unit based quality improvement: an evaluation of a support strategy. *Quality and Safety in Health Care,* 11(4): 308-14.

Ward, J., Cody, J., Schaal, M. and Hojat, M. (2012) The empathy enigma: an empirical study of decline in empathy among undergraduate nursing students. *Journal of Professional Nursing*, 28(1): 34-40.

Web, C. and Shakespeare, P., 2008. Judgements about mentoring relationships in nurse education. *Nurse Education Today*, 28(5): 563-571.

Wilkinson, J. E., Powell, A. and Davies, H. T. O. (2011) *Are clinicians engaged in quality improvement?* London: Health Foundation.

World Health Organisation (2011). *Multi-Professional Patient Safety Curriculum Guide.* Available: http://www.who.int/patientsafety/education/curriculum/Curriculum_Tools/en/ [Accessed 14/11/14].