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Building research capacity and productivity among advanced practice nurses: an evaluation of the Community of Practice model

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Abstract

Aim. The aim of this study was to evaluate Wenger's Community of Practice as a framework for building research capacity and productivity.

Background. While research productivity is an expected domain in influential models of advanced nursing practice, internationally it remains largely unmet. Establishment of nursing research capacity precedes productivity and consequently, there is a strong imperative to identify successful capacity-building models for nursing-focussed research in busy clinical environments.

Design. Prospective, longitudinal, qualitative descriptive design was used in this study.

Methods. Bruyn's participant observation framed evaluation of a Community of Practice comprising 25 advanced practice nurses. Data from focus groups, education evaluations, blog/email transcripts and field observations, collected between 2007 and 2014, were analysed using a qualitative descriptive method.

Findings. The Community of Practice model invited differing levels of participation, allowed for evolution of the research community and created a rhythm of research-related interactions and enduring research relationships. Participants described the value of research for their patients and families and the significance of the developing research culture in providing richness to their practice and visibility of their work to multidisciplinary colleagues. Extensive examples of research dissemination and enrolment in doctoral programmes further confirmed this value.

Conclusion. A Community of Practice framework is a powerful model enabling research capacity and productivity evidenced by publication. In developing a solid foundation for a nursing research culture, it should be recognized that research skills, confidence and growth develop over an extended period of time and success depends on skilled coordination and leadership.

Keywords: advanced practice nurses, community of practice, qualitative research, research capacity

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Why is this research needed?

- Internationally, influential models of advanced nursing practice note research as an integral practice domain. However, the prominence of this expectation in job descriptions and policy documents does not necessarily translate into research productivity.
- Previously published evaluations of research capacity building note a lack of defined outcomes and methodological rigour.
- Wenger's Community of Practice model presented a promising theoretical and practical framework for research capacity building that could assist senior nurse clinicians to meet their advanced practice domains.

What are the key findings?

- Wenger's Community of Practice model invited varying levels of participation, allowed for evolution of the research community and created a rhythm of research-related interactions and enduring research relationships.
- Community of Practice members perceived value in their research findings for their patients and families. They noted the significance of the developing research culture in providing richness to their practice and visibility of their work to multidisciplinary colleagues.
- Value was further demonstrated through extensive examples of research productivity and dissemination and through enrolment in higher degree research.

How should findings be used to influence practice, research and education?

- Wenger's Community of Practice should be considered as a model to enable research capacity, productivity and publication for advanced practice nurses.
- It should be recognized that in developing a solid foundation for a nursing research culture, research skills, confidence and growth develop over an extended period of time.
- Skilled onsite coordination and leadership appear to be vital components for a successful and productive nursing research Community of Practice.

Introduction

Advanced practice nurses (APNs) must provide clear evidence of research productivity to address the research domain in influential models of advanced nursing practice (Ackerman *et al.* 1996), government policy (NSW Health 2011) and role descriptions (Cashin *et al.* 2014). There are co-existing gaps in research preparation and infrastructure to support APN research (Watson *et al.* 2005) and the prominence of research expectations in organizational and policy documents does not necessarily translate into research activity (O'Baugh *et al.* 2007). It is, therefore, important to consider frameworks for research capacity building. Nursing research capacity is a necessary precursor to productivity requiring specific skills, a culture of collaboration and sustainable pathways for conducting research in busy clinical environments.

While O'Byrne and Smith (2010) claim the expected level of nursing research competency remains unclear, APN role descriptions including Clinical Nurse Specialists (CNS) in the UK and US (Baldwin *et al.* 2013) and Clinical Nurse Consultants and Nurse Practitioners in Australia (Table 1) clearly articulate important research expectations (Chiarella *et al.* 2007, NSW Health 2011, Mick & Ackerman 2013). This study will use the broad term of Advanced Practice Nurse (APN) when discussing such roles.

Background

O'Byrne and Smith's (2010) review of 16 papers describes three nursing research capacity-building models: the Evidence-Based Practice Model focussing on skills in appraisal and synthesis to facilitate research translation (Melnyk 2007); the Facilitative Model focussing on research leadership (Ryan & Aloe 2005, Stetler & Caramanica 2007) and the Experiential Learning Model that develops individual capacity through direct, 'hands-on' learning (Fitzgerald *et al.* 2003, Priest *et al.* 2007). Evaluations of these models note a lack of defined outcomes and methodological rigour (O'Byrne & Smith 2010, Bäck-Pettersson *et al.* 2013, Wilkes *et al.* 2013).

There is also evidence that health service managers consistently value the domains of clinical service and consultancy over research when considering APN workloads (Wilkes *et al.* 2013). The expectation for research productivity for Australian APNs and the obvious difficulty they had complying, despite their desire to achieve high-level research outcomes (Bloomer & Cross 2011, Wilkes *et al.* 2013), led to the establishment of a Research *Community of Practice* (CoP) (Wenger *et al.* 2002). This is a variation in the experiential learning model providing both situated learning and research mentorship to build research capacity.

The Community of Practice (CoP)

Wenger (1998) conceptualises a CoP as a vehicle for collective learning in a field of shared human endeavour,

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Table 1 Domains of practice of APNs in Australia.

Nurse Practitioners in Australia Australian Nursing & Midwifery Board (ANMB 2014)	Clinical Nurse Consultants in Australia (NSW Health 2011)
Nurse Practitioner (NP) roles are guided by National Standards that describe a senior nurse clinician who: 1) assesses using diagnostic capability 2) plans care and engages others 3) prescribes and implements therapeutic interventions 4) evaluates outcomes and improves practice NPs are also expected to "implement research-based innovations for improving care". Most NPs in Australia qualify with a Master of Nurse Practitioner.	In New South Wales, Australia, a Clinical Nurse Consultant has a position description covering five domains: 1) *Clinical Service and Consultancy*; providing expert clinical advice to health professionals, patients and carers; 2) *Clinical Leadership*; facilitating development of expert clinical practice; 3) *Research*; initiation, implementation and dissemination of research findings; 4) *Education;* developing and delivering specialty education programmes; 5) *Clinical Services Planning and Management;* participating in strategic and operational positioning of their clinical service NSW CNCs ideally have postgraduate qualifications with a Masters being the desired preparation (ANMB, 2013).

enhanced by mutual concerns, passions and regular group interactions. Three crucial criteria define a CoP and our application as a model for research capacity building: *the Domain* – a shared commitment to the domain of interest; *the Community* – members engage in group activities to learn from and support each other and *Practice* – CoP members are practitioners. CoP members develop a bank of resources embodying elements of shared practice that may include stories, tools and approaches to problem-solving (Wenger *et al.* 2002, p. 27-40).

The experiential learning model is extended by Wenger's positioning of people as social beings and his concept of *situatedness* extends understandings beyond 'learning-by-doing'. Knowledge develops through active participation in a valued enterprise with learners fully participating in their world and generating meaning (Tennant 1997, p. 73, Wenger 1998, p. 4).

CoPs may exist in many forms: face-to-face or online; some formally recognized and funded, with others informal. The concept is applied in business, government, education and professions and enables connections across formal organizational structures.

CoPs require cultivation; fostering participation rather than organizing and directing. Wenger describes seven principles that foster the CoP's energy and internal direction (Wenger *et al.* 2002, p. 13). These theoretical principles which frame our evaluation are: designing for evolution; opening dialogue between insider and outsider perspectives; inviting differing levels of participation; developing public and private community spaces; focussing on value; combining familiarity with excitement and creating a rhythm for the community. While the CoP model has been used in nursing practice development (Tolsen *et al.* 2006) and to develop health research capacity (Short *et al.* 2010), no rigorous evaluation has been published.

The study

Aim

The aim of this study was to evaluate Wenger's (2002) CoP model for building research capacity and productivity of APNs.

Design

Bruyn's (1966) participant observation, in a longitudinal, qualitative descriptive design, was used to evaluate the CoP as a model for research capacity building. While there is little precedent for Bruyn's method in health service evaluations, with its origins in social anthropology, it has a rich history conceiving systematic, qualitative descriptions and explanations of the symbolic modes of life amongst distinct social groups. The participant observer describes the natural meanings and expressions of participants in his/her own way and interprets these expressions in the light of theory (Bruyn 1966, p. 185). The method includes both interviewing and observation and requires the observer to share in the life, activities and culture of the social group. Personal involvement, including sympathetic identification, is recognized as part of the research; however, researchers refrain from moralizing or judging (Bruyn 1966, p. 66). This study therefore provides a description of the documented traces of behaviours, beliefs and events and presents our

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understandings in a manner that best fits and remains close to the data (Sandelowski 2000, 2010).

Participants

The onsite CoP coordinator (and researcher), a doctorally prepared Clinical Nurse Consultant (CNC) (JG), invited participation from 40 APNs from a single teaching hospital in Sydney, Australia. Twenty-five APNs with median of 20-years' experience expressed interest and provided written consent (Table 2).

Most participants self-selected into research clusters (3-5 APNs) created around clinical groupings. Each cluster was mentored through a qualitative research project. Three participants (one cluster) withdrew due to workload and two left the institution (6-months after training and before their research commencement), having agreed to retention of the early data they contributed. Four new participants joined; two as new employees and two returning from extended leave.

Participant preparation

The onsite CoP coordinator provided research mentorship and with a university-based academic (SW), coordinated 14-hours of face-to-face workshops (2-3 hour sessions), along with a CoP resource website and blog site for communication and peer support. Situated 'learning-by-doing' for each cluster then followed.

Data collection

Sources of CoP evaluation data included 170 group emails and blog communications, 58 education session evaluations and field observations of APN engagement in the CoP from 2007–2014. Six focus group interviews with APNs at three time points were conducted by two independent academics not otherwise involved in the study. Interviews were audio-recorded and professionally transcribed.

With publication an important endpoint, observation continued until the final cluster using phenomenology achieved publication. Outcomes included evidence of research dissemination: publication in peer-reviewed journals; reports to professional organizations or government; conference presentations; workplace seminars and research-focussed teaching delivered by participants. The prolonged exposure in the research setting was managed with a continued focus on active collaboration by the coordinator, as participant observer and an open attitude that focused on freedom of expression, encouragement and acknowledgement of each small step achieved by participants in complex clinical roles.

Table 2 Characteristics of participants.

Role descriptor and gender	*N* (%)	Highest qualifications	*N* (%)
CNCs	23 (92%)	Bachelor degree	3 (12%)
NPs	2 (8%)	Graduate Certificate	2 (8%)
Females	23 (92%)	Graduate Diploma	7 (28%)
Males	2 (8%)	Masters degree	12 (48%)
		PhD	1 (4%)

Ethical considerations

Hospital and university ethics committees approved the study. APNs were not directly approached for recruitment but answered an email expression of interest. To further reduce the opportunity of coercion, APNs could participate in research training and mentorship without themselves being participants of this evaluation. Participants were allocated pseudonyms. Because participants know each other, participant characteristics and their links to quotes are kept to a minimum to maintain confidentiality.

Data analysis

Data were firstly read, reflected on and thematically organized by both researchers. Whilst Qualitative Description most commonly uses content analysis, other approaches to data analysis are accepted providing the methodological processes are clearly articulated (Caelli *et al.* 2003). We reference Caelli *et al.*'s understanding of Qualitative Description which describes the use of an analytic lens to determine meanings as 'embedded in the theoretical context of the research'. This fits well with Bruyn's description of analysis for participant observation, requiring data to first be deconstructed intellectually, separating events (research-related interactions), beliefs (about personal research capacity in own APN practice) and patterns of conduct (demonstrating engagement with, or disconnection, from research behaviours) so that new relationships become apparent. These are then reconstructed in a manner that relates them to a theoretical viewpoint (Bruyn 1966 p.34).

Wenger's Seven Principles for cultivating a Community of Practice were therefore used as the analytic lens to describe the central representations around which the culture of the CoP was organized. Recurring categories and patterns that were fully developed and seen to cut across

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the data set were identified (Caelli *et al.* 2003) and the extent to which the explanations seemed trustworthy and appropriate to the theoretical framing of the CoP were considered.

Rigour

Bruyn's construct of 'six indices of subjective adequacy' guided the rigour of this work (1966 p. 180–5). Our design demonstrates adequate Time, observation occurred over 7 years (longer observation increasing accurate interpretation of social meanings); Place, a geographical closeness allowing observation in the context of participants' everyday lives; Social Circumstance, measured by the large number and variety of observer-witnessed social circumstances; Language, the researcher as an insider was conversant with professional vernacular and social nuance; Intimacy of Encounter, the researcher participated in professional encounters, meaningful gatherings and rituals in APN culture and Social Consensus, by recording how participants confirm meanings, directly in conversations among themselves in their natural setting and indirectly by observing professional rituals and gatherings. An audit trail, interview guides and independent initial coding by researchers further enhanced rigour.

Theoretical positioning (Caelli *et al.* 2003*)* is an important element of rigour. The researchers identified several self-held attitudes towards the phenomenon prior to study commencement. JG, a colleague of participants, performed a similar APN role. She had initiated research projects as both junior and senior clinician and later as a clinical academic. She believed APNs' research capacity was a matter of confidence, process knowledge and commitment. The participant observer needs to incorporate aspects of engagement and detachment (Bruyn 1966 p.14; Patton 2015): this required constant reflection given JG's position as a pre-existing member of that community.

SW, a university academic, believed clinical nurses prioritized content knowledge (their comfort zone) over other types of knowledge. The APNs' immersion, comfort and identity in the 'busyness' of the clinical area was believed by both researchers to be a major barrier to the production of research-based nursing knowledge. SW's position as an outsider allowed investigator triangulation, helping to minimize interpretation bias.

Findings

Wenger's (2002) Seven Principles to foster a CoP's own energy, character and internal direction provide the theoretical framework for discussion of our results (Table 3). Key design aspects allowing *evolution* of the community emerged through group learning in negotiated research clusters. This was enhanced by flexibility of education delivery and cluster activities, staged research processes and onsite research coordination. Flexibility was the most important determinant in participant engagement with face-to-face education with every session held at least twice and available online.

Training time for the APN's was negotiated with nursing administration as 'in-kind' support as part of an Industry/Faculty funding agreement. Although APN time was not backfilled, attendance levels were high. Session evaluation data indicate that attendees had difficulty in arranging release from their clinical duties on the day for 43% (n = 24) of evaluated occasions of attendance. Despite this difficulty in 'getting away', the educational activities made participants feel valued. This was attributed to the nursing focus of the research and the structuring of learning around their needs: '…and to be invited to participate in it!' (Morgan, FG-5).

The onsite-positioning of the coordinator and her APN role meant that she was well-known and deemed accessible:

> She was very supportive, always accessible and really drove both projects. You could always ask questions… and that's what you need in a busy hospital… it's hard to get the headspace and it still has to come from within… but you need someone driving it and giving that enthusiasm. (Helen, FG-6)

Research clusters created their own group learning strategies, sharing ideas and learning from each other:

> We used strategies like, sit in and listen to an interview and pull it to pieces and say 'How would we improve on this next time? (Tina, FG-2)

The research was offered at two stages using the same data set (Table 4). The nurses firstly sorted and reported their data using a qualitative, quality improvement method (Picker Dimensions of Care) (ACI (NSW Agency for Clinical Innovation) 2014) allowing acquisition of foundational research skills and incorporation of findings into the quality improvement cycle. Members and/or clusters could complete/exit at this stage. For the three clusters who wished to go further, the second stage involved more in-depth analysis using Heideggerian phenomenology.

The Picker Dimensions suited APNs who either felt too time poor for deeper research engagement, or who were uncomfortable with the dense nature of phenomenology. Vanessa was somewhat overwhelmed by hermeneutic analysis:

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Table 3 Data elements relating to Wenger's theoretical principles.

Principles	Identified data elements	Evaluative comments
Designing for evolution (Wenger 2002, p51)	• Flexible education delivery • Two-stage research process • Group learning in negotiated research clusters built on co-existing personal/professional networks • Onsite research coordination • Research clusters created their own group learning strategies • Nursing focus of the research • Structuring of learning around the APNs needs • Research capacity building & productivity is a long-term process • Each cluster had different ways of working	• Design should not impose structure, but assist the community to develop. Some participants were convinced by their peers to join rather than initially expressing interest & these members were less productive.
Opening dialogue between inside and outside perspectives (Wenger 2002, p54).	• Onsite, insider coordination strengthened coordinator understanding of the community's needs • Implementing recommendations meant drawing in & negotiating with other members of the multidisciplinary team • Research dissemination lists sent to nurse & hospital administrators • Medical heads of department became aware of nursing research findings • Research dissemination through professional organizations, department of health performance & redesign, research-informed clinical teaching & publication in peer-reviewed journals	• While the university academic, as a co-designer & researcher provided an outsider perspective, the embedded nature of the CoP coordinator may have limited potential for innovation.
Inviting different levels of participation (Wenger 2002, p57-8)	• Opt-out possible for second stage of phenomenology • For highly productive members, research meant homework • In every cluster a natural leader would emerge & at least one member had a significantly reduced level of participation • Need for negotiation around levels of contribution • Less active participants still felt they were members of CoP	• Members were unprepared for unequal level of contribution • Clinical busyness created unequal contribution • Some push ahead but others could feel left behind/excluded • The full time clinical role of coordinator meant less active members were likely to receive less attention
Develop public and private community spaces (Wenger 2002, p 58)	• Website useful as a repository for resources • CoP visible on the agenda for CNC meetings • Limited public community focused events • Multiple public research sharing events • The enduring web of research relationships strengthened the APN community	• Blog not useful due to lack of time • The privacy of email preferred as a communication medium

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Table 3 (*Continued*).

Principles	Identified data elements	Evaluative comments
Focus on value (Wenger 2002, p59)	• Research constantly framed as a key indicator of CNC/ NP professional performance. • Educational activities made participants feel valued • Acknowledgement of quick wins • Research dissemination lists to all CoP members • Made nursing inquiry observable, changed practice & improved patient & family experience • Awareness of a developing research culture & ability for growing independence • Awareness of personal & professional growth.	• A difference in value perceived between involvement in medically oriented studies vs. nursing-focused research which was seen as more meaningful within the group
Combine familiarity with excitement (Wenger 2002, p62)	• Research analysis weekend • Half-day research presentations • Team teaching delivered by APNs to UG & PG nursing students • Creation of a short film by one cluster that won a short film award • Oral & poster presentations at conferences	• Larger events did not need to be frequent to be effective • Smaller events were often member/cluster driven • Clusters that engaged with these opportunities were the most successful
Create a rhythm for the community (Wenger 2002, p62-3)	• Corridor chats were a motivating force within & between clusters • Most rhythmic activity happened at cluster level • The coordinator created much of the rhythm behind the scenes	• Groups that had less internal energy & motivation were less responsive to coordinator communication, meeting action points, etc. were, unintentionally, less likely to receive coordinator time

I really enjoyed the Picker review… it was straightforward; you knew what you were looking for. It wasn't the layers that you have to go through for the other… (Vanessa, FG-4)

Cathy, however, felt the Picker Dimensions were over-simplistic and enjoyed the abstraction of phenomenology:

The Picker was almost superficial… like the questionnaire you have in a hotel… it ticks all the boxes for some people but… it didn't push any buttons for me. (Cathy, FG-5)

Helen also enjoyed the intellectual rigour of phenomenology. It delivered richness to her role and an understanding of patients and families that stood out against the task-orientated 'housekeeping' aspects of her job. As a member of one of three clusters that eventually achieved publication of highly philosophical papers, Helen reflected on her early engagement with philosophically informed research:

The intellectual richness, it was a different way of communicating with others… I remember trying to say 'Heideggerian Hermeneutic Phenomenology' {laughing}… I had to present it at this conference and it took me a week… I had it up on the fridge. (Helen, FG-6)

Nurses' experience of 'clinical busyness', commonly cited as a barrier to research capacity and participation (Priest *et al.* 2007, Richardson *et al.* 2007) was the greatest challenge for participants and putting time aside in the diary was not always sufficient:

It's about being structured… allocating time… then striving for that… You treat it like a luxury to do research… and still the clinical aspect of your role overrides that. (Narelle, FG-2)

Because of the constraints of clinical business, it became apparent to participants that research work meant 'homework'. This was perceived as either an intrusion, or as a way of managing work they valued, but could not fit into an 8-hour day:

It started to impose on our home life… we shifted from doing it in the hospital to, 'I don't have time for this', so then you take it home… You didn't have that designated time. (Freya, FG-5)

Others chose to take research home because of mutual convenience to their participants and themselves:

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Table 4 Structure of APN research process.

Elements	Processes
A two-stage analysis of a single qualitative patient and family data set collected by the APNs. 1) Picker Dimensions of Care	Stage 1 – Picker Dimensions of Care *Process*: A quality improvement method to determine areas for patient and family centred service improvement (Picker Institute, 1998, ACI (NSW Agency for Clinical Innovation) 2014). Qualitative interview data are themed and prioritized under the dimensions of: (1) Access to care; (2) Respect for patients' values, preferences and expressed needs; (3) Coordination and integration of care; (4) Information and education; (5) Transition and continuity; (6) Physical comfort and clean and comfortable environment; (7) Emotional support and alleviation of fear and anxiety; and (8) Involvement of family and friends. Picker findings were used by each cluster to develop a report with recommendations to the local Area Health Service and to the State Health Department's Performance Improvement Unit. Results were further disseminated through conference and seminar presentations. Clusters/members could finalize their engagement with data at this stage, if they wished. *Purpose:* Allows acquisition of foundational research skills (ethics process, recruiting and consent, qualitative interview skills, basic thematic interpretation) and the incorporation of findings into the quality improvement cycle. Has a focus on service development as an important domain of APN practice. Provides a method for patient and family engagement embedded in the quality processes of NSW Health. Provides experience in quality reporting with a focus on developing and implementing quality recommendations.
2) Heideggerian Phenomenology	Stage 2 – Heideggerian Phenomenology *Process:* Hermeneutic analysis of patient and family interview data using an existential philosophical framework (Heidegger 1962). This circular interpretation process of "reading, writing, talking, mulling, re-reading, re-writing" (Smythe *et al.* 2008, p,. 1393) uses back-and-forth comparisons between the parts (individual quotes and stories) analysed against the whole (greater backdrop of the participant within their described family and broader culture and society). Dissemination of phenomenological findings occurred through conference and seminar presentations, postgraduate teaching by clinicians and peer-reviewed publication in high quality nursing journals. *Purpose:* To develop a "thick" narrative description (Ryan & Aloe 2005) of the lived experience of illness and hospitalization for generating new nursing knowledge. To expose APN's to a rigorous qualitative research method with a strong conceptual and philosophical grounding as a basis for analysis and writing for publication.

I did the [phone] interviews from home… It was easier when the kids had gone to school and I had a quiet environment… I'm in an office with three other people. (Linda, FG-6)

Unequal levels of contribution were discussed at length by participants. There were times when cluster instability, because of leave or secondment, undermined continuity of cluster work. In this study the strongest, most productive clusters had at least two motivated core members. Usually a natural leader would emerge and take responsibility for pushing progress and every cluster had at least one member who had significantly less involvement:

You've always got people who form different roles within a group… people that have more motivation… are better at interview skills… or better at analysis. They'll pull right back on things that they're not interested in or believe they're not good at. (Morgan, FG-5)

At times, a lack of collaborative progress meant one or more people would push ahead to achieve a project outcome. Melinda explains:

In my cluster it was a bit disappointing that some… wouldn't engage. That created a bit of friction… Even though we tried really hard, I still felt guilty 'cause we took it and ran, but I also felt… a bit let down by the others. (Melinda, FG-5)

From another cluster, Linda described feeling left behind in relation to a quality initiative that emerged from their cluster work:

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We weren't included, yet our name was on it… we felt really bad that we didn't contribute, but we wanted to contribute. (Linda, FG-6)

A focus group discussion reflected on the important aspects of cluster formation and the CoP structure as a whole:

When people aren't pulling their weight you need to try and figure out why. Is it simply lack of confidence? So they need support and motivation to continue (Morgan, FG-5)… And I guess we put our own expectations onto others, 'You should be feeling the same as me'… And you can't enforce that (Freya, FG-5)… People have different ways that they work and behave… Even something like Meyers-Briggs [personality typing] might be useful in identifying how we can bring the best to a given situation. (Cathy, FG-5)

The level to which inactive participants still considered themselves CoP members was surprising and pleasing and demonstrates that learning and a sense of inclusion can occur at many levels. (Wenger 2002, p. 57) describes the need to 'build benches' for those on the sidelines to keep members feeling connected. Judy attended research training but did not actively participate in her cluster. She described her vicarious engagement four-years after CoP commencement:

From the outset I felt really motivated and excited that there was a group movement happening. I haven't given up on it yet. I still consider myself a part of it. (Judy, FG-5)

At CoP level, participants created and valued space for face-to-face interactions about research through corridor chats and on a more public level, gave regular CoP reports at APN meetings. The CoP gathered once for a half-day of research presentations, further education and discussion. Interview data revealed that despite heavy clinical workloads, participants would value more opportunities for whole-of-CoP engagement.

A blog site had been created as public space for busy CoP members to support the rhythm of community interactions. However, the majority did not find the blog useful. The most common reason provided was lack of time and traditional communication formats suited participants better. With the CoP established 'pre-Facebook' (2007), this culture of social media was not well-established:

The blog is more social chit-chat… (Meg, FG-2)

I'd rather email [coordinator] 'cause I think I'm stupid sometimes… It's a privacy issue… maybe I don't want to share this query? (Narelle, FG-2)

Adding to the rhythm of the CoP was the process of combining 'familiarity with excitement' (Wenger 2002, p.62). We occasionally punctuated the day-to-day cluster activity with special events. This was framed in a way that was relaxed and enhanced the bonds between CoP members:

Okay guys… Here is a proposition. We have a house… nice spot on the water, 10 beds, wine glasses in the cupboard for postanalysis bonding. What do you think about an intensive research analysis weekend?… This would rely on most of your interviews & NVIVO training being complete… (Email from coordinator to clusters 16/6/08)

Clusters investing time for these opportunities had the greatest research productivity and dissemination.

The 'focus on value' was created by making personal and professional growth visible. Our participants initially described a lack of insight into research processes, a lack of confidence and skills and an inability to translate research from their university courses to practice. This disturbed them because research was constantly framed as a key indicator of their professional performance.

…there's all this talk about 'This this is in your description, you need this to make practice better…' but then there's a lack of pathways to support you. (Judy, FG-5)

'A focus on value' was firstly made visible by acknowledging quick wins and communicating research dissemination lists to all CoP members:

I think it was good for [coordinator] to remind us how far we'd gone… to give us… 'quick wins' when we presented… posters… conferences… We ran some [gastrointestinal] study days… the feedback we got from that was really great… It gave us more energy to say 'This stuff is valuable'. (Vanessa, FG-4)

'Value' was communicated through findings that made nursing inquiry observable, changed practice and improved the experience of patients and families as illustrated by the following field note:

Tina raised car parking with Master Planning. From June, there will be Courtesy Transport for visitors and patients, with pick up from main car park and drop off near main entrance. Tina also met with Head of Department re draft Picker report. He was very excited… rang the Director of Nursing and said 'I love this sort of research!' (2/5/09 Coordinator field notes)

While some APNs had been involved in data collection for medical-led studies, they valued this nursing-focussed research. The qualitative methodology gave them access to understandings about their patients that surprised them,

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despite their long clinical experience. In some instances, revelations related to service delivery:

It makes us understand that just one tiny little thing… can be the focus of their entire experience of hospital. (Morgan, FG-1)

On a deeper level, there were profound, shared aspects of patient and family experience not previously apparent and this new knowledge changed their whole approach to patient care:

One patient talked about his pain score, not physical but emotional… 'My nightmare score is 8 but my pain score is 2'. So trying to understand the impact of that life-changing event… I thought this guy looked okay… and when you start talking they have so many issues and a lot are psychological, hidden because you just look at the physical side. (Helen, FG-3)

A successful research-focussed CoP is a long-term project (Figure 1). Participants reflected on the length of this project, noting it was the duration of intensive engagement that allowed eventual publications in peer-reviewed journals and the feedback of that work into professional growth and clinical practice change. 'Value' was palpable as the CoP developed research confidence and established a culture of inquiry:

It's incredibly rewarding to have something published internationally. That's what makes you feel this project has been a success. Getting to that endpoint, but then realizing, publication is not the endpoint… I would never have envisaged four-years later we would still be going but it has led me to do another phenomenological research project… Obviously that has developed some sort of research culture… It's given me the confidence to do it myself. (Morgan, FG-5)

CoP members not only expressed professional growth but also personal growth in a nurturing community:

I was new in the role so it opened-up avenues… to network… get to know what was happening outside… to take the doors off if you like… So we've achieved that… To see people's faces instead of their emails… and I'm very thankful at this stage of my career… I've never really felt mentored in nursing… it's really helped me to be a better person and at the same time learn about research. (Gretel, FG-4)

Discussion

The aim of this study was to evaluate a research CoP for building nursing research capacity and productivity. Increased capacity was demonstrated through the descriptions of increased confidence and further independent research activity. Increased productivity was evident from the clear research outputs generated (Table 5). Research findings were disseminated through peer-reviewed journals (Khatri *et al.* 2012, Gullick *et al.* 2014, Monaro *et al.* 2014) and multiple conference presentations and were incorporated into research-informed university teaching delivered by APNs at both undergraduate and postgraduate level.

When considering how to 'design for evolution' (Wenger *et al.* 2002, p. 59), we believed that introductory research-focussed education was important; a view supported by our participants and others (Fink *et al.* 2005, Parkin & Bullock 2005, Newhouse *et al.* 2007). The quality of CoP coordination was another important aspect of designing for evolution and skilled, onsite research mentorship was pivotal to our outcomes. Strong leadership has been emphasized internationally in reports of experiential learning (Fitzgerald *et al.* 2003, Priest *et al.* 2007) and in research capacity building generally (Perry *et al.* 2008, Strout *et al.* 2009, Caan *et al.* 2005). Our participants attributed the CoP's success to the coordinator's availability, flexibility, skill-set and willingness to drive the project.

For Wenger (2002), designing for evolution is founded on the premise that CoPs develop on pre-existing personal networks. This was achieved by drawing research clusters from existing clinical alignments. The subsequent dynamics in each cluster then either enhanced or impeded research productivity. Successful clusters created structure around progress and meetings and the 'pushing' gradually shifted from initiatives of the CoP coordinator to an expression of intrinsic cluster motivation. In the assignment, or self-selection of participants to clusters, previous working/personal relationships did not necessarily guarantee productive research relationships. More careful thinking about personality traits and clinical synergies between cluster members from the beginning may have enhanced planning and formed a basis for cluster management throughout the project's life. For example one cluster of very senior APNs with differing specializations within a broader clinical service collected data, but did not proceed to analysis. For us this highlighted that clinical experience and professional drive do not necessarily translate to group research productivity. Interestingly, some in this cluster were encouraged by their peers to join the CoP rather than self-nominating; a phenomenon noted to result in less engagement for several participants across the CoP.

Designing for the evolution of increasing skill and depth of research was facilitated by the use of two distinct analytical methods of varying complexity that appealed to

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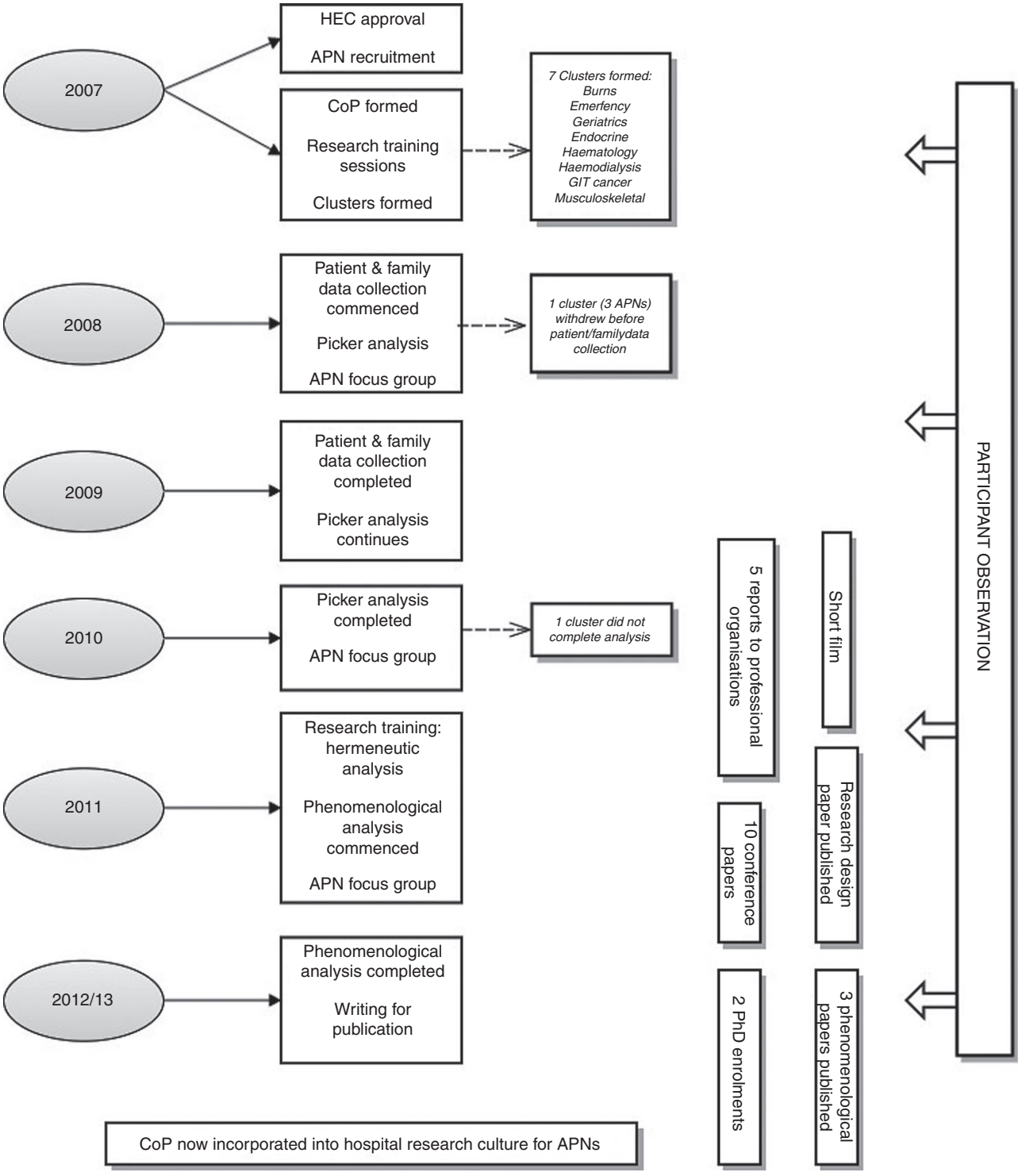


Figure 1 Community of practice evaluation timeline.

different personalities and levels of academic interest. Gullick and West (2012) provide further detail on the specific framework and joint application of these analytical approaches. The Picker Dimensions of Care are very practical in their application to quality and service development and so addressed other important domains of APN practice. Although this method is more aligned to quality improvement than rigorous research, by beginning with a simple, more immediately applicable approach, quick wins were achieved and participants remained intellectually

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Table 5 Community of practice research output (2008–2014).

Type of output	*N*
Published peer-reviewed journal articles	4
Draft manuscripts for peer-reviewed journals	3
International conference presentations	8
National conference presentations	2
State Government Health Department reports	5
Short film	1
Research awards	2
Professional publications	3
Professional seminars	7
APN-led lectures (Bachelor of Nursing students)	3
APN-led lectures (Master of Nursing Students)	5

engaged in the CoP. Importantly, our research design included an 'opt-out' option so nurses could exit their investigations after disseminating findings from their Picker analysis and making recommendations for practice change through a report to the Department of Health.

'Inviting differing levels of participation', as an element of good CoP architecture (Wenger 2002, p. 55) was articulated to some extent by this opt-out option. While the expected level of engagement was communicated from the beginning at CoP level, it was perhaps not sufficiently discussed at cluster level where there was a preconception that everyone would 'pull their weight'. The reality of unequal contribution was frustrating to many participants.

Clusters could be strengthened by early cluster-level discussions on ways of working, framing expectations and responsibilities to establish 'house rules'. For example it may have been valuable to pre-empt the opportunity of cluster members having variable levels of contribution. Such discussions could inform decisions about how individuals and clusters would deal with this situation in relation to work distribution, communication and authorship; important aspects of research training.

Our participants noted the reality of research as 'homework'. This may require re-conceptualisation of APN 'work' from the current clock-on/clock-off understanding to a professional/intellectual model where scholarship is a matter of 'being' rather than 'doing' and nurses continue to reflect on APN practice outside of their contracted hours (Goodman 2012).

Wenger's construct of 'a focus on value' (2002, p. 59) explained the motivation of successful CoP members and was strengthened as participants became aware of productivity and a systematic development of a body of knowledge. The 'value-add' was integral, because as our baseline data and international research suggests, APNs feel undervalued (Wolf 2013) and are underprepared for the research domain of their roles, both in educational preparation and practical infrastructure (O'Byrne & Smith 2010). The invisibility of CNS work in the UK and USA (Leary *et al.* 2008, Fulton 2013) and CNC work in Australia (Cashin *et al.* 2014) is ubiquitous, with their research and practice/systems development role unnoticed by the healthcare community, policy-makers and the public.

A focus on value was communicated more broadly as CoP members created an open dialogue between insider and outsider perspectives (Wenger 2002, p. 54) liaising with their multidisciplinary team, managers, colleagues from other institutions and with government and professional bodies. These discussions increased their visibility as clinicians and researchers and strengthened their confidence and ability to communicate their research productivity.

The detailed examples provided have demonstrated the robustness of Wenger's theoretical principles for CoP cultivation and the model's potential for developing research capacity, productivity and collegiality. There was evidence of important and meaningful nursing research output, addressing the lack of defined outcomes and methodological rigour in previous evaluations of research capacity building (O'Byrne & Smith 2010). During this project, two participants enrolled in doctoral programmes and a third expressed plans to. Our local health district is establishing a nursing professorial chair and this may further bridge the practice/research gap for APNs. A limitation of the CoP model for research capacity building is the prolonged time between clinician's data collection and publication. This is a consequence of heavy clinician workloads and the absence of 'research time' in work-pattern planning.

Limitations

The highest educational award for 12% of the APNs was a Bachelor degree and only 48% were educated to Masters or PhD level. This may differ from educational preparation of APNs internationally and there may be lower expectations for research use and capacity for non-Master's prepared nurses (AACN (American Association of Colleges of Nursing) 2006). Transferability of our findings is also contingent on the availability of skilled, onsite research expertise.

Conclusion

A Community of Practice framework is a powerful model enhancing collegiality and enabling research confidence, capacity and productivity amongst APNs. This model may lead to significant output as evidenced by publications in

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peer-reviewed journals, conference presentations, ongoing research activity and enrolment in doctoral programmes. In developing a solid foundation for a nursing research culture, it should be recognized that a community's skills, confidence and growth matures over an extended period and ongoing success is dependent on skilled coordination and leadership.

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Conflict of interest

There are no perceived conflicts of interest.

Author contributions

All authors have agreed on the final version and meet at least one of the following criteria [recommended by the ICMJE (http://www.icmje.org/recommendations/)]:

- substantial contributions to conception and design, acquisition of data or analysis and interpretation of data;
- drafting the article or revising it critically for important intellectual content.

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