The factors influencing nurse graduates use of mobile technology in clinical settings in Perth Western Australia: A mixed method study

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Chapter Five

Qualitative Phase

Introduction
The previous chapter described the methods, analysis, and the results of the quantitative phase of this mixed methods study. This chapter describes the second qualitative phase: the methods, analysis, and the findings. An illustration of the qualitative phase is presented in Figure 59.

Figure 59. Design of the qualitative phase of this study

The qualitative phase of the study was divided into three stages with each being sequentially conducted. As can be seen from the above diagram in each stage thematic analysis of data was used (see Figure 59). Since the same process was used in all stages, as a prelude to this qualitative phase of the study, the following narrative provides an explanation of the thematic analysis process.
Thematic analysis
Initially the researcher became familiar with the content, and the depth of information provided within the responses from across all qualitative data sets. This step involved reading the data separately multiple times, and transcribing the data into a consistent format (Braun & Clarke, 2006). A constant comparative analysis of the data assisted to identify patterns, trends and relationships between data sets. Data was grouped together, named into categories, and patterns were arranged into relationships (Casey & Kruger, 2009).

Specific questions posed in the text-based responses from stage four; focus groups in stage five; and open ended interviews in stage six, were placed in a Microsoft Word® table. This process provided consistency across each data set during the analysis, and aided in a structured approach to identifying initial categories. The data was reviewed and checked for accuracy and by using this systematic approach, it was possible to identify interesting aspects and repeated patterns (see Appendix 14). The next step in the analysis was to generate further categories. These were then transferred into a concept map with each research question subheading at the centre (See Figure 60).

Figure 60. Concept map sample with initial codes
The process of creating a concept map enabled direct visualisation of specific categories. The third step in the analysis of the data combined the categories into potential overarching themes (Braun & Clarke, 2006).

The fourth step in the thematic framework used in this study, involved defining and naming the potential themes (see Figure 61). Patterns in the data from all the potential themes within all the concepts maps, combined into a final concept map (see Figure 63 for an example from stage four). The final concept map contained the main research question at the centre, which focused on the aim and objectives of the study. It enabled visualisation of the final themes and subthemes, (See Figure 64).

Figure 61. Concept map sample with initial codes combined into potential themes.
The structured approach to thematic analysis of data maintained a sequential nature of the study, and consistency across all the three stages in this qualitative phase of the study. This framework facilitated identification of patterns and trends to compare one segment of data with another and to identify similarities and differences. It also enabled the researcher to identify interesting aspects, repeated patterns and significant statements that further explained participants’ experiences (Braun & Clarke, 2006).

Within the stages four to six, a systematic, separate process for the data collection and analysis was utilised (Casey & Kruger, 2009). The next part of this chapter details the sequence of events in each stage of the qualitative phase of this study.

![Stage four](image)

- Thematic analysis of quantitative online survey text-based responses
- Develop open ended questions from the survey for online text-based focus group interviews

*Figure 62. Stage four of the qualitative phase*

**Stage four**

Stage four of the qualitative phase of the study involved reviewing the findings from the quantitative phase of the study that required further explanation and clarification. The pertinent findings were used to develop the open-ended questions for the focus groups. This process connected the two phases of the study in an effort to minimise the threats to validity (Creswell & Plano Clark, 2011).

Participants responding to the quantitative online survey provided comments and statements at the end of each subheading. These subheadings included:

**Section One subheadings**

- Mobile technology in learning and teaching relating to the clinical setting
• Nursing graduates use of mobile technology in the clinical setting
• Mobile technology in learning and teaching relating to the University setting.
• Mobile technology use by nurses and other health professionals
• Policies and guidelines associated with mobile technology in the clinical setting

Section Two subheading

• Factors influencing the use of mobile technology in healthcare (TAM2 framework)

Analysis of the comments and statements from each subheading enabled development of open-ended questions for the online text-based focus group interviews. Only two text-based responses were noted in the TAM2 section. These two separate responses reflected general feelings and perceptions of mobile technology. It appeared that some participants might have thought this was the final chance to comment about the survey. In fact there was space provided at the bottom of the survey for participants to write a final comment.

The following process was utilised to identify the participants from each set of data. To protect their identity, all responses were given a number. For example, text-based responses from the quantitative online survey were titled: Text-Based Responses (TBR 4) with the number following the abbreviation belonged to the individual participant. For consistency within the qualitative phase, stage five online focus group interview responses were titled: Focus Group Interview (FGI 4). Stage six incorporated open-ended responses with nurse leaders. These titled: Open Ended Survey (OES 4).

The first part of stage four, involved thematic analysis of the text-based responses using the framework as previously described. It was noted there were text responses to each of the subheading/s from section one and two. All questions in section two the survey randomised so participants could not identify potential themes that related to the TAM2. This procedure also contributed to the robustness of the study.
Analysis of the findings resulted in the creation of seven concept maps based on the five subheadings in section one, section two and the final question in the survey which was directed to the perceptions of nurse coordinators, educators and managers of graduate programs, regarding mobile technology use in the clinical setting. The concept maps enabled visualisation of the categories. Each map enabled further refinement into potential themes, and the development of a final concept map (see Figure 63).

![Concept Map](image)

**Figure 63.** Stage four final concept map sample with potential themes combined into themes/subthemes
In this final concept map, potential themes were collapsed into categories to create the final themes and subthemes (see Figure 64). Analysis of the final themes and subthemes, addressed the following two research questions:

1. What factors influence nurse graduates use of mobile technology in the clinical setting?
2. To what extent and in what ways do nurse graduates currently use mobile technology in the clinical setting?

Four broad themes emerged from the analysis of the quantitative text-based responses (see Figure 64).

*Figure 64. Final themes and subthemes from text-based responses from quantitative phase*
Themes and subthemes from the text-based responses from the quantitative phase

Three subthemes relating to the theme ‘Influence of others’ were also identified. The following narrative details the comments from the participants. It is worth noting, that the comments were written as online responses and may at times have been grammatically incorrect. Care has been taken to provide an explanation where appropriate.

Point of care resource.

The first and recurrent theme identified from the text-based responses was that mobile technology was used at the point of care. Usefulness could be seen as an influencing factor on the role of the graduate registered nurse.

Participant’s provided examples of mobile technology as a preferred point of care tool in relation to medication administration and calculation; education and communication with patients; and as a learning tool. As an example, one participant commented that:

I find the use of mobile technology assists me with medication rounds. For example, a patient of mine had a low bp [blood pressure] and I was unsure whether the drug I was giving would make it drop further. I looked it up and discussed the side effects of the drug, we decided to withhold it (TBR 62).

Similarly, another participant stated: “I use my smart phone to access MIMS [Monthly Index of Medical Specialties®] and other apps, however, most nurses do not know it’s available (TBR 52)”. Another participant stated: “Mobile technology is a good tool for quick references like generic names of medications (TBR 36)”.

In regards to ease of use with medication administration, one participant wrote: “Using my phone to look up medications is super easy and fast in the morning med round. It would be nice if there was a device we could use without breaching policy (TBR 4)”.

It was interesting to note that at the participant’s hospital site, no policy or guideline existed for the use of mobile technology. As explored in the following qualitative stages, graduates might have been directed by other staff in the use of mobile technology when no policy or guideline was available. The term ‘policy’ may refer to senior staff direction/s in the example.
Another participant highlighted the use of mobile technology for safety in calculating medication doses. This was stated as: “I sometimes use my mobile phone in the medication/treatment (only accessible by staff) room to calculate dosage of medications when I don't have my calculator with me (TBR 9)”. This statement was also confirmed by: “Another thing I use my phone for is medication calculations, due to the risk of infection and the med area being a clean room, we can't have calculators, therefore we use our phones (TBR 14)”. In terms of mobile technology as a point of care tool for education and communication with patients, a participant wrote: “It allows me to have access to the most up to date information that can help assist in giving education to patients as well as increasing my knowledge (TBR 37)”. It was also pointed out that mobile technology was useful when communication difficulties and language barriers were experienced at the point of care. For example, another participant indicated: “I once used my mobile phone to assist with Google translate for a patient speaking Portuguese, when a translator or family was not available (TBR 21)”. This response was further supported by another participant:

I've also found language translation technology extremely useful at the bedside as we encounter a number of non-English speaking patients and given the nature of The ED [Emergency Department] environment it becomes extremely useful in communication between myself and the patient when doing secondary assessments and understanding patient needs, - also in communicating what I require the patient to do (TBR 26).

A common view amongst the participants in regards to the perceived usefulness of mobile technology at the point of care, was summed up in the following comment:

I think it would be very useful if hospital policies, nursing practice guidelines and other information such as about medications (e.g. MIMS) could be accessed on mobile phone or tablets, so that it can be taken to patient bedside or the treatment room. It would also be helpful in providing patient education as it can act as a visual aid and may assist in increased understanding and compliance by patients (TBR 9).

In relation to the use of mobile technology as a learning tool at the point of care, one participant indicated mobile technology suited their learning style when using the
resource at the point of care. Surprisingly, one participant preferred their own familiar learning tool when they transitioned to the clinical setting as a graduate:

I find that I am a visual learner, therefore when I do not understand the process of a procedure I like to research and find videos and diagrams. This is rather than having a senior staff member explain it to me, I find this harder to understand. In such a case I turn to trusty google and for back up I'll check an evidence based book or go into my eBook’s (TBR 14).

Currently, within a University undergraduate nursing program, students are taught how to access and critique a variety of evidenced based care resources. Many of these resources can be accessed through mobile devices. Linking University to the clinical setting as a graduate, a participant wrote: “Many evidence based apps are available to access health care information and medication safety (TBR 23)”. This link between University and the point of care as a graduate, was also described by another participant:

I used the noteability app to take notes on my iPad during Uni. I still have all my Uni notes available to me through the iCloud and information is easily accessible through the noteability[TM] app on my phone via device sharing (TBR 3).

Using mobile technology within a specialty area at the point of care may also be a factor which influences it use. In regards to one specialty area, one participant wrote:

I work in ED and am frequently encountering unfamiliar patient conditions and medications which I will research on my phone to gain a better clinical picture of what's going on with the patient etc, all staff carry their mobile in their pockets and use them frequently in clinical practice (TBR 26).

In contrast, and in response to not being able to use mobile technology as a learning tool at the point of care, a participant stated: “nurses should be allowed to research conditions and access MIMS. Also there should be a tablet or portable device we can access on each ward (TBR 8)".
**Preferred over ward personal computers.**

A variety of perspectives were expressed by participants, who reflected on their personal preference for using their own personal mobile technology device instead of the ward personal computers (PCs). A common view amongst the participants was that difficulties existed with accessing ward PCs. Some of the difficulties from the participants were associated with the time taken to log into the ward PC, or that ward PCs were inaccessible or unavailable. One example of the difficulty relating to the time taken to access the ward PC from one participant was:

I see many health professionals using mobile technology to look up drug names and dosages as well as health conditions. We have a good amount of computers to access in the department, however, it can take up to 5mins to log into one to be able to use it so I find mobile technology much quicker to access relevant information (TBR 60).

In terms of the challenges in accessing personal logins on the ward PCs, another participant stated: “Imagine having an app whereby you're able to pull up your hospitals policies and guidelines, on your phone without having to wait 15mins to get into your VMWare! [Hospital software program] (TBR 14)” . A similar response in regards to ward PC availability: “It is often not possible to access one of the ward computers due to high demand so it is useful to be able to check out MIMS on line or other apps such as Medscape, JBI etc (TBR 56)” . In addition, another participant stated: “(Staff) encouraged to use ward computers but they're always in use or there's not enough time during work hours to use them (TBR 4)”.

A preference for tablet, or portable access over ward PCs was evidenced by another participant who wrote:

I feel that there is mixed feelings about mobile tech. I work in a high IT environment, but using your phone to google something quick is frowned upon. Getting to use a computer can be hard sometime as all of the doctors take them over. If tablet access was available it would make a huge difference (TBR 19).

Similarly, another participant suggested that an improvement to efficiency of their care could be: “Filing and note systems should be moved over to iPad devices that are portable (TBR 54)”.
Some graduates indicated they were not allowed to use mobile technology to access other resources. An example included: “At times computers are unavailable - therefore online MIMS and clinical data bases are unable to be accessed. Word of mouth from other nurses is then obtained (TBR 23)”. Another example: “In the clinical setting I don't have my mobile device on me. However, I will often look up information on the hospital computer (policies etc) (TBR 6)”. This was in contrast to another participant however, referring to their clinical practice rotations when they were a student: “If I didn't know a medication and couldn't log onto a computer (as I didn't have a HE [Hospital login account] I would use my MIMS app online. I'd find out about the medication and then educate my patient with my preceptor (TBR 14)”.

The example implies, that student access may be limited to ward PCs and resources. To maintain safety when administering medications to a patient for example, students may access point of care resources they are familiar with from University, by using their own mobile technology.

Influence of others.
It was clear from the participants’ responses, that others influenced them in the use of mobile technology. Firstly, mobile technology was used covertly due to the negative perceptions from other staff. Secondly, some participants felt there were inconsistencies in mobile technology use when directed by older staff. Whilst some were supportive others were not. Finally, some participants argued that some younger staff used mobile technology for clinical applications as a link from University to clinical settings. The following examples provide evidence of these recurrent subthemes that included covert use of mobile technology in clinical settings; inconsistencies in mobile technology use; and younger staff usage.

Subtheme: Covert use.
A common view amongst the participants was that they were not trusted by other staff, in the use of mobile technology. As one participant said: “It sometimes feels like you are being judged by other nurses for using your phone at work even if it is
for clinical reasons (TBR 63). Discrepancies within the multidisciplinary team (MDT) in using mobile technology created confusion for one participant:

I'm unsure as to the hospital's exact policy. We are told to only use our phones in the clinical area in case of receiving an emergency call. I usually duck off to the medication room or nurses station if I need to use my phone. As a student it was forbidden to have your phone on the floor at all. Many JMO's [Junior Medical Officers] also use their phone at the bedside if unsure of medications/dosages/diagnosis etc which makes me feel like it isn't a problem to do so (TBR 60).

The above participant’s example could be considered multifactorial in providing valuable context to understanding the influence of others in the use of mobile technology. Firstly, the participant stated that based on their experience as a student, they were not permitted to use their phones. As a graduate, however, the participant used her phone covertly as she was unsure of hospital policy. Seeing many doctors use mobile technology at the bedside, the participant may have diagnosed an unfair situation. This participant’s example of mixed messages lead to the covert use of mobile technology and highlights the discrepancies faced by graduates’ in the clinical setting.

One participant felt that the staff and patients negative perceptions of mobile technology use, motivated her to its covert use:

Patients and other staff are likely to think that I am using mobile technology for unprofessional reasons because it is a hospital policy (? as we were told in our orientation/induction session for the graduate program) to not use mobile phones in the clinical area. I sometimes use my mobile phone in the medication/treatment (only accessible by staff) room… (TBR 9).

A similar response regarding covert use: “…I have seen maybe nurses use their mobiles to find out certain patients conditions and medications, yet they are somewhat having to hide due to a stigma about mobile technology…(TBR 14)”.

In contrast to the covert nature of mobile technology use and the perceived negative perception of use, one participant noted an alternative solution. This view was expressed by a participant who works within a hospital that utilised work stations on wheels (WOW’s) or computers on wheels (COW’s): “The work stations
on wheels [WOW’s] help with accessing information and have a less 'unprofessional' aspect than looking at your mobile phone (TBR 62)

Behavior in regards to the covert nature of mobile technology use, may be explained from the participants’ experiences as student nurse on clinical practice in the following examples. The participant indicated: “I currently only use mobile technology during my breaks as it is not generally acceptable practice whilst out on the ward (TBR 56)”. Another stated: “We were told never to have our phones when on prac as a student as it looked unprofessional (TBR 63)”. Interestingly, one participant wrote in upper case letters: “FORBIDDEN (TBR 21)”; and another further confirmed this view by stating: “The use of mobile phones on prac was always strictly prohibited (TBR 2)”. 

As a final example of the covert nature of mobile technology use when transitioning from a student to a graduate, one participant, indicated:

I would use my phone on my break to lookup anything I wasn't sure of due to the University threats if we were to use our phone on the clinical floor. I even had a facilitator tell me I couldn't use my phone on my 30min break as the Uni rules were not to have it on you at all. Needless to say I didn't sit with her on my break again (TBR 60).

The above example provided an interesting perspective on the nature of mobile technology use as student, that may have impacted their use as a graduate. It was noted the participant distanced herself from the staff member, who did not support personal use of mobile technology. This example provides linkage into the next subtheme of the ‘inconsistencies’ of staff in their use of mobile technology and the negative attitude, or positive support provided to the graduates.

**Subtheme: Inconsistencies in mobile technology use.**

A subtheme uncovered in the participants’ responses was the inconsistencies from in staff in the use of mobile technology. Generally, participants believed that older staff were not supportive of using these devices. For example, one participant stated that “A few senior nurses have made negative comments about the use of my phone to look things up, however others have commented that it’s a good idea (TBR 4)".
Since mobile technology is a recent innovation used for learning some of the older staff may have been unfamiliar with its use as learning resource. They may have less trust around clinical mobile technology use, and therefore, focused on potential negatives associated with its use. For example, one respondent wrote: “Some of the senior nursing staff discourage about using technology re: confidentiality issues. Also some believe that using textbooks was the right way and are not open to new technology (TBR 37)”. This example leads into the next subtheme where it was noted younger staff appear to use mobile technology more than older staff in the clinical setting. The impact of senior nurses influencing the use of mobile technology in the clinical setting, was explored further in stage six of the qualitative phase of the study.

**Subtheme: Younger staff use.**

In contrast to older nurses generally being unsupportive of using mobile technology in the clinical area, some participants argued that younger nurses were more likely to make use of their devices. As stated previously, this issues may be related to education and experience in the use of mobile technology in the University setting. The following comment highlighted the differences between younger nurses and older nurses:

> It is apparent that the majority of people that are open to the use of mobile technology in my workplace are newer nurses that have received education through their respective universities to use mobile technology in the workplace. "Older" nurses (the majority) are against it and have issues such as confidentiality and unsure of the education one can receive from mobile technology (TBR 37).

A similar comment was that mobile technology is the ‘way forward’ for education and for safety of patient care. The example highlights differences in older and younger nurses and the influence of others in the clinical setting. Challenges, however, exist due to perceptions of misuse from their peers, which might have led to younger staff using mobile technology covertly:

> Given that it was purely for work intended purposes and not misused then I feel mobile technology is the way forward. Anything that improves
patient outcome and aids the Nurse to educate their patients is important and deserves a chance. I have seen maybe Nurses use their mobiles to find out certain patients conditions and medications, yet they are somewhat having to hide due to a stigma about mobile technology (TBR 14).

**Policies regarding mobile use.**

The final theme that may have influenced the graduate registered nurse use of mobile technology, were related to the policy or guidelines regarding its use in the clinical area. For example:

It allows me to have access to the most up to date information that can help assist in giving education to patients as well as increasing my knowledge. I don't use mobile technology for NPS [nursing practice] due to RPH policy though (TBR 37).

Another participant considered that: “It would be nice if there was a device we could use without breaching policy (TBR 4)”. Some participants were unsure of policy but used the resource covertly. As previously indicated, one participant stated:

I'm unsure as to the hospitals exact policy. We are told to only use our phones in the clinical area in case of receiving an emergency call. I usually duck off to the medication room or nurses station if I need to use my phone (TBR 60).

Another participant confirmed the covert use due to instructions at hospital orientation that related to a policy. It was noted for this participant in the data collection, that their hospital site has no specific policy or guideline available for staff. This was reflected in their response where they wrote:

Patients and other staff are likely to think that I am using mobile technology for unprofessional reasons because it is a hospital policy (? as we were told in our orientation/induction session for the graduate program) to not use mobile phones in the clinical area. I sometimes use my mobile phone in the medication/treatment (only accessible by staff) room… (TBR 60).

One participant expressed disappointment at not being able to use their mobile technology: “As policy notes mobile phones aren't to be used we aren't able to access mobile information unfortunately (TBR 49)”. This was an interesting
comment, considering this same hospital did not have specific policy or guideline on mobile technology use. It would appear that participants were directed by senior staff and nurse leaders, such as the nurse coordinators, educators and managers of graduate programs.

The themes and subthemes that emerged from the quantitative online survey were used to develop open-ended questions for the focus group interviews. This process linked the quantitative and qualitative phases of the study.

**Development of open ended questions for text-based focus group interviews**

The researcher continuously referred back to the research questions, prior to developing the open-ended questions for the text-based focus group interviews. The major benefits of open-ended questions included: the participants determining the direction of the responses; responses based on personal specific situations; and unexpected responses (Krueger & Casey, 2009).

A number of specific techniques were employed to maximise the quality of data collected from the open ended questions. These techniques involved: asking participants to ‘think back’ to relevant experiences for context of the responses; avoiding asking ‘why’ to reduce impulsive or habitual responses; keeping the questions simple to get to the core of the topic; creating conversational questions; sequencing the questions with care for a focus of moving from general to specific examples; estimating the timing for each question; gaining feedback; and revising the questions (Krueger & Casey, 2009).

A total of 14 open-ended questions were created for the text-based focus group interviews. The planning, organisation, conducting and analysis of these interviews are described in stage five of the study.
Figure 65. Stage five of the qualitative phase

Stage five
Stage five of this phase of the study incorporated the planning and organisation of the online text-based focus group interviews; data collection; and the subsequent thematic analysis of the responses.

Planning and organisation of the sample group
An introductory personal email with basic instructions (see Appendix 15) was forwarded to the 26 participants who had consented on the quantitative online survey to being contacted. An attachment to the email included the information sheet from the participant’s specific hospital, which contained details about the study and how to participate (See Appendix 8). The email included a hyperlink to pre-recorded personal YouTube® video (2.39mins) narrated by the researcher. The video provided a basic summary of the study, together with an invitation to be part of the qualitative study.

A reminder email was forwarded a week later, with instructions to a link for an online scheduling poll for the focus group interviews. The poll enabled all potential participants to view and select a number of times/dates, to maximise involvement. For flexibility of involvement, both weekdays, weekends and afternoon/evenings times were included as options. This flexible approach was based on the challenges around shift work patterns. The online scheduler also provided the researcher with updates whenever a time/date was selected.

It was noted, however, some of the graduates had forgotten their self-nominated time and date. The researcher contacted the participant and negotiated a different schedule. On reflection, although the online scheduler was promoted to
provide benefits of using online options and flexibility, the researcher also had to be flexible in negotiating alternative arrangements with the participants. Such flexibility included a weekend interview, and the rescheduling of a number of interviews via email.

Twenty six potential participants indicated on the quantitative online survey their consent to be contacted regarding the online text-based focus group interviews. Following the initial emails to all these people, five email addresses were incorrect, or bounced back as errors. This reduced the cohort of participants to twenty one potential participants. It was noted during this stage, one participant who responded preferred an open-ended survey to be emailed instead of using the online focus group software. A total of four online focus group interviews were conducted, with one participant completing the open-ended survey of the same questions. One of the focus groups had two participants logged into the interview from separate locations. This resulted in six participants being involved in this stage of the research. To increase the trustworthiness of the data: the same participants from the quantitative survey took part in the qualitative phase (Creswell & Plano Clark, 2011).

Data collection for the online text-based focus group was defined as data collected in real-time similar to an instant message conversation. (O’Connor, Madge, Shaw & Wellens, 2008). A similar example of data collection would be an email conversation interview (Wilkerson, Iantaffi, Grey, Bockting & Rosser, 2014). It was argued that online qualitative data collection interactions was equivalent and considered superior when compared to face-to-face (Campbell, Meier, Carr, Enga, James, Reedy & Zhang, 2001; Hinchcliffe & Gavin, 2009; Kenny, 2005; Reid & Reid, 2005).

The online text-based focus group interviews, were facilitated using Skype™ (version 7.27.32.101; Skype™, 2016): a communication software. This is a proprietary Voice Over Internet Protocol (VOIP) service, and has been used in qualitative research as a useful alternative, or replacement to face-to-face interviews (Deakin & Wakefield, 2013). It is available on many mobile platforms, enabling easy and flexible access for participants who have time and place limitations for face-to-face interviews. It encouraged increased participation, whilst providing the researcher with a cost-effective tool (Cater, 2011; Deakin & Wakefield, 2013).
Skype™ also had the potential to overcome low numbers of participants in face-to-face focus groups. Use of the text-based function, had the additional benefit of a degree of anonymity for the participants. It also aided in minimising the power differentials that can occur with in-person focus groups (Krueger & Casey, 2009). In addition, the mobile app Skype™ was the third most popular application used by students in a pilot investigation by the researcher on the evaluation of tablet technology and social media with first year nursing students (Clark-Burg, Carr, Hay & McNaught, 2014).

The focus groups were effective in eliciting data on the cultural norms of the participants within their clinical settings, and for generating overviews of concerning issues (Mack, Woodsong, MacQueen, Guest & Namey, 2005). The focus groups aimed to find the range of opinions of participants across several groups or sites, in order to compare and contrast data. Conducting focus group interviews were also important to identify trends (Krueger & Casey, 2009).

To minimise unseen challenges and to test the tool, a pilot online, text-based focus group interview was undertaken with academic colleagues and the researcher’s supervisor prior to conducting the formal interviews with graduates. The prior testing of the technology; process; questions; and feedback from participants, was found to be useful activity (NPS Medicinewise, 2012).

The process of managing the online focus groups was similar to the current use of Learning Management Systems used by staff and students schools of nursing across the universities in Perth, WA. When using the text-only function within Skype™, participants were able to write responses to questions prompted by the facilitator, whilst simultaneously seeing each other’s responses. An additional benefit of using the Skype™ platform was that participants could remain anonymous to each other since no video, or audio was recorded or utilised. This process enabled a less confronting environment for the participants. Moreover, participants could also use Skype™ from any of their mobile devices, thus providing a measure of flexibility.

During the focus group interviews, text-based entries were moderated throughout the discussions by the researcher. A title was provided before and after
the questions for easier identification (NPS Medicinewise, 2012). To maintain consistency across the groups, the same questions were asked in all focus groups (Creswell & Plano Clark, 2011). During this process the researcher was able to clarify questions by responding to previous responses and cut and paste questions into the Skype™ platform. Previous interview transcripts were easily referred to during the interview by the researcher for identification of trends or patterns in the responses.

Some unexpected benefits of using this platform included: while waiting for the participant to respond to the question posed, Skype™ displayed the message that a ‘person was typing’. This provided the opportunity for the researcher to reflect and consider the previous response by the participant, while the participant was typing their next comment. Similarly, the other participants could respond to questions and make comments and clarifications based on what all participants were reading in the live responses. This process enabled the researcher to easily clarify and refer to previous comments to questions as the interview evolved. As there were smaller numbers of participants, the interview did not feel rushed.

A major benefit of using the Skype™ platform, was that on completion of each interview, the responses were copied and pasted into a Microsoft Word® document for later analysis. Using this online method for qualitative data provided easy access to transcripts, which facilitated collation and identification of themes (Markham, 2008).

Two facilitators (researcher and supervisor) managed and organised the online focus group interviews. The researcher asked and facilitated the questions, which included probing further as required. The researcher’s supervisor could also keep track of the comments and emerging trends in the data (NPS Medicinewise, 2012).

Distinct patterns and themes were noted within the groups, and based on the findings a saturation point was achieved (Polit & Beck, 2014; Schneider, Whitehead, Elliot, Lobiondo-Wood & Haber, 2012). A saturation point had been achieved earlier in the data collection process, as specific patterns and trends became repetitive (Polit & Beck, 2014; Schneider, Whitehead, Elliot, Lobiondo-Wood & Haber, 2012). The
researcher, however, decided to continue with all planned interviews with the participants as they were keen to contribute their time to the study.

To enhance credibility of this stage, a final question at the end of the interview asked participants if they would consent to being contacted again to review the findings. This involved an email attachment, which included the opportunity to provide brief comments and feedback on the final themes and subthemes.

Themes and subthemes from the focus group interviews
The consistent approach to the thematic analysis of data, as previously mentioned, was utilised throughout stage five of the qualitative phase of the study. A total of twelve concept maps were created from each question. The central focus of the concept maps was research question concerning the factors influencing mobile technology use by new RN graduates. The responses to this question were collapsed into categories, which facilitated the identification of themes and subthemes. This process is illustrated in Figure 66.
The themes and sub-themes were collated and named into a final figure diagram (See Figure 67).
Figure 67. Final themes and subthemes from the online focus group interviews

**Point of care resource.**

The theme of mobile technology being useful or important resource at the point of care, was a constant theme noted in both the text-based responses from the quantitative phase of the study and in this qualitative phase. The benefits of using mobile technology included personal learning as well as educating patients. One participant remarked that:

Mobile technology is very relevant to my role as a RN in my current clinical setting. I am currently based in a General Medicine ward which has a variety of complex cases that present on a daily basis. I use mobile technology not just as a portable MIMS but use it as a visual tool that I explain procedures such as a TOE (Transoesophageal echocardiogram) to patients who may not understand the entire procedure just from a verbal discussion with the doctor (TGI 6).

From a personal learning perspective, mobile technology was considered: “extremely useful” (FGI 1); (FGI 2); (FGI 4) (FGI 5) & (FGI 6); “relevant” (FGI 1);
(FGI 3), “very important” (FGI 4) “and helpful” (FGI 1). One interesting example, was based on the participant’s interaction with a medical company who regularly used mobile apps to assist nurses learning. This unexpected finding could be seen as providing safe patient care:

I feel the only way to expand my knowledge and skill set is to embrace technology as a variety of the medical companies that I have dealt with prefer to use mobile technology. For example: Fisher and Paykel produce the AIRVO2 which a high flo nasal delivery system which I had no experience using. I contacted the wards representative of F&P which they advised me of an AIRVO simulator app which I practice playing around with settings in a mock environment, rather than trying it out on an oxygen deprived patient! (FGI 6).

Another example of using mobile technology as an ongoing educational tool at the point of care, was highlighted by another participant:

My patients influence my use of mobile technology by asking me questions that I do not know. I can tend to gauge what kind of patients appreciate things such a diagram of a procedure vs just verbally talking them through a procedure (FGI 6).

Encouraging mobile technology apps and resources successfully for patient care may further influence its use at the point of care. For patient care, the communication app Skype™ was utilised by one participant, which demonstrated a perceived improvement in communication and compliance with care:

Helping a patient that lived overseas and was admitted to our ward while on holidays. They did not know how to contact their family other than expensive phone calls. A colleague and myself set up Skype™ for the patient as well as assisted their family on the other end so they could do video calls on a daily basis while keeping costs to a minimum as well as the patient stated they felt better talking face to face with loved ones vs just on the phone. I feel it contributed to positive things such as an increase in the patient’s compliance to the treatment which is a great outcome for all (FGI 6).

Mobile technology, as a point of care tool, might have been influenced by how familiar the participant was with the resource. This is discussed within the following subheading with examples from the participants.
Subtheme: Bridges gap from University to clinical areas.

The first subtheme identified, related to mobile technology providing a bridge to point of care from University. One participant stated: “Uni really encouraged us to use mobile technology so in that regard I went into my grad program with an understanding of the benefits of using mobile technology appropriately in the work place (FGI 4)”. Another participant confirmed this view: “…it was demonstrated very clearly what a useful tool it could become in the workplace… (FGI 2)”.

A further comment from one participant implied that the use of mobile technology, lead to encouraging and sharing the same resources with colleagues in the clinical area. The participant stated: “[my University] always actively encourage me to use mobile technology in all of the units that I studied over my three years… I was also introduced to a variety of apps that I have now shared with fellow colleagues (FGI 6)”. This example highlighted the potential impact of quality learning and point of care resources acquired within the University setting, that had application to the clinical area. A similar response from another participant said: “Other staff who use mobile technology influence the way I communicate with them on a daily basis ie sharing new apps / teaching” (FGI 6). The same participant stated benefits within the multidisciplinary team when sharing these point of care resources: “I am now on a ward where both Doctors and Nurses use mobile technology on a daily basis to not only educate themselves but actively encourage others to learn new things (FGI 6)”.

One participant, when discussing how mobile technology bridges gaps in knowledge from University to the clinical area, highlighted the concept of adult learning. The participant highlighted an important aspect for their learning, by first clarifying the information, and then seeking senior staff for further understanding. This suggests mobile technology in the clinical area may enhance learning for nurse graduates in the following example:

…many of my best learning experiences came from being directed to the right place to find information rather than just being told what to do. It allows us to gain a basic knowledge and use more experienced nurses to clarify our understanding. It promotes adult learning… mobile technology helps us to bridge gaps in our knowledge (FGI 4).
Ongoing use of mobile technology for learning, was confirmed by another participant who stated: “In University we are encouraged to use mobile technology every day - in fact it’s not just encouraged, but essential. It's how we learn (FGI 5)”.

Another participant confirmed the frequent use for ongoing learning: “We were often encouraged to utilise our mobiles to search for information (FGI 1)”. This implies that when the participant was a student, they were encouraged and frequently used this resource for information searching and to bridge gaps in knowledge. This was further evidenced by another participant: “…can use it to increase their knowledge on medications even at home – not just in the clinical environment (FGI 6)”.

It would seem curious however, that this familiar method of learning was not encouraged to the point of care when transitioning into clinical areas as a new graduate. Some clinical areas and specialities positively embraced mobile technology at the point of care: “I have seen mobile technology used and embraced in point of care situations is with St Johns ambulance emergency transfers and in oncology with chemotherapy administration databases to make transfer of care between outpatient and inpatient settings easier (FGI 5)”. In some areas, however, challenges existed where some clinical areas had not kept up with point of care technology. A final comment by a participant questioned as to why bedside nursing care has not evolved similarly, in relation to other advances in technology in the clinical areas:

However when the rest of our world is turning digital, and even hospital services like HR and ROSTAR and CIMS forms all require digital form submissions as its easier to file, store and retrieve data, its curious why our bedside nursing care hasn’t evolved similarly (FGI 5).

Subtheme: Resources accessed with mobile technology.

The second subtheme relating to mobile technology use at the point of care, was highlighted by responses commenting on useful medication resources such as apps. One participant found benefits of point of care mobile technology use within their particular clinical area, by stating: “I find mobile technology very important in my workplace (FGI 2)”. To explore what extent and what ways mobile technology was important in participant’s role, it was clarified further in the focus group interview at the time. The response suggested point of care benefits for medication administration and evidence data bases:
As a new graduate I also find mobile pharmacology apps very important as it gives me the opportunity to look up medications quickly on the go… having access to a large database of information quickly is really important especially if you are still trying to learn the ins and outs of time management and are a bit time poor (FGI 2).

As a practical tool, one participant stated: “I often use mobile technology to research medications…. it helps me get info fast (FGI 3)”. Another participant confirmed its use for medication administration by stating that: “As a new graduate I also find mobile pharmacology apps very important as it gives me the opportunity to look up medications quickly on the go (FGI 4)”. Accessing mobile technology when administering medications may also increase safety. One participant states: “I think every time I can do a medication round safely because I can quickly look up medications is a positive (FGI 4)”. These participant responses can be linked to using mobile technology as a resource for time efficiency.

**Time efficiency-preferred over ward PCs.**
The personal use of mobile technology provided participants with time saving benefits. A similar theme was also noted in the text-based responses from the quantitative phase of the study. This preference for personal use of mobile technology, was based on the familiarity with the resource learnt in the University settings. Sharing resources with their colleagues may have also saved time at the point of care.

An example of a preference of mobile technology over existing ward technology was evidenced in the following example: “Looking up medication interactions on the MIMS app instead of searching through the book or waiting for the computer to be free - it’s a lot faster and the information is easier to sort through on mobile devices (FGI 5)”.

A similar response was echoed by another participant: “Sometimes access to computers is limited so being able to use my mobile to search for things such as medications has saved me a lot of time (FGI 1)”.

A lack of access to ward PCs at ward level was seen as a common issue, with another participant stating that mobile technology was: “Very useful as the lack of computer availability is always a problem (FGI 2)”.

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As a time saving device, participants commented that: “It's right there with me. If I'm in the medication room and someone is using the medication station I can look up information whilst waiting (FGI 1)”. Another example was it: “helps me get info fast (FGI 3)”. In addition to time saving benefits, mobile technology was perceived as easy to use by a number of participants with the following example: “I find it useful because my mobile is small, I can put it my pocket. It’s easily accessed. I can wipe it down (FGI 1).”

One participant expressed challenges relating to transitioning from student to graduate when learning time management. This was evidenced as: “having access to a large database of information quickly is really important especially if you are still trying to learn the ins and outs of time management and are a bit time poor (FGI 4)”. Furthermore, the same participant stated: “…having the ability to simply search a policy or medication without having to search through books or files has saved me a lot of time (FGI 4)”. In terms of professional development, mobile technology affords flexibility. This concept was evidenced with one participant stating:

It would make it easier to access in off work time as well for professional development. It’s frustrating wanting to know more about a certain procedure and not being able to have enough time to research it thoroughly or being too tired at the end of a shift, or wasting paper (FGI 5).

An improvement to productivity and time saving could be achieved if mobile technology was allowed to be used as stated by one participant: “I feel having mobile technology available in the area that I am working in would make for a more productive work environment (FGI 5)”. This frustration of a waste of time was highlighted: “Oftentimes we are queued up waiting for the computer to do research or other projects during downtime - it’s ineffective to have stationary technology in a critical care area (FGI 5)”.

**Influenced by other nurses.**

A major theme that was highlighted across both quantitative and qualitative phases was the influence of others. A common trend influencing the participant’s use of mobile technology was, the role of the person present at the time. This aspect linked
to the second research question: what extent and in what ways do nurse graduates currently use mobile technology? This question was probed in more detail within the interview questions. Two distinct subthemes emerged which included the use of mobile technology covertly due to the negative perceptions of other staff, and the inconsistencies noted in senior nurses directions in using mobile technology. For example, one participant stated: “The lack of acceptance being the biggest roadblock (FGI 3).” This level of acceptance seems to vary between staff and the team. For example, some senior nurses, educators or managers may have supported mobile technology use, where others did not. For example: “I have met some CNS’s [Clinical Nurse Specialist’s] who allow us to use our personal devices for on-hand referencing, but a majority tend to indicate a distrust in the appropriate use of mobile technology, especially personal devices, in the clinical setting (FGI 5).”

An unexpected finding related to participants’ decisions to use mobile technology, was based on both positive and negative examples from others. For example, one participant stated that as a junior nurse, they took cues from senior nurses. When witnessing unprofessional use, the same participant assumed responsibility for their own professional use:

If senior nurses encourage and use mobile technology in the clinical setting, as a junior nurse I generally take cues from them. However, there have been some instances where I have witnessed inappropriate use (in my opinion) and tend to take responsibility for my own use in an appropriate manner (FGI 5).

The influence of other nurses on the participants’ use of mobile technology was reflected in a number of responses. Some participants indicated that older nurses distrust technology:

I think despite having a policy or guideline that would encourage its use, a lot of the old-school nurses who are in senior positions still distrust the technology and its potential benefits. I also think that there might be a reticence to use mobile technology by these nurses as they have been trained a certain way and making changes to accommodate mobile technology in the clinical setting is another burden, something else for them to learn and integrate into their busy schedules…(FGI 5).
Based on potential negative perceptions related to the influence of senior nurses, one participant provided a comment which evidenced her frustrations: “Having nurses that are so against all mobile technology – I can't share wonderful things to aid them in reducing work load. ‘Work Smarter NOT Harder!!’ (FGI 6)”. This disappointment cemented that senior nurses posed a barrier to mobile technology: “the barriers - primarily being senior nurse’s attitudes to mobile technology. I think people are scared of the unknown and the what if’s that mobile technology brings into the healthcare setting (FGI 5)”. Despite this barrier, participants’ tended to make covert use of mobile technology.

**Subtheme: Used covertly due to negative perceptions.**

The participants’ often raised the negative perception of others as a motivation for using mobile technology covertly. A typical comment highlighted this notion:

> Other people’s perception of mobile technology use affects my use. If I'm on my phone then people will assume that I'm on Facebook rather than doing something work related. It can give the perception that you aren't interested or are being lazy (FGI 4).

When asked what covert use might look like, one participant provided an example which reflected the preferred use of mobile technology. The junior nurse’s actions were changed based on who was around at the time:

> Looking up medication interactions on the MIMS app instead of searching through the book or waiting for the computer to be free - it’s a lot faster and the information is easier to sort through on mobile devices. I have seen junior nurses do research like this in the treatment room while senior nurses are not there. If the senior nurses are there they wait and use the book/computer when they are free (FGI 5).

One participant highlighted that although mobile technology is used covertly, they are trying to positively change perceptions within their team. This interesting example included:

> I've been trying to introduce a few of the older nurses to using the technology available and for the most part they have been quite receptive.
In this way I'm trying to alter the perception of technology use to make it more accepted (FGI 4).

**Subtheme: Inconsistencies in use from senior nurses.**

Whilst participants acknowledged that senior nurses influenced their decision to use mobile technology, they found frequent inconsistencies in directions. This was reflected in the following example:

As a graduate nurse I was on a ward for six months where I was surrounded mostly by veteran nurses who solely relied on textbooks and hands on learning to increase their knowledge and skills set. They were against all mobile technology – with even one saying that it could put the patient in danger (FGI 6).

The same participant commented that she had been directed to an older learning resource that the senior nurse used. This method of finding a resource was unfamiliar to the participant who commented that:

[I was checking] a medication on my online MIMS at the patient bedside prior to myself administering it as I was unsure of the dosage that was prescribed. Nurse said that I should not trust my online version but use the wards MIMS that was down the end of the other corridor. Both versions are exactly the same but the nurse in question questions the validity due to it being mobile technology and not something that they have always relied on in the past (FGI 6).

The above statement implied the participant had a portable, newer, and more up to date version of the MIMS resource, which could have been used at the point of care. The direction from the senior nurse meant that the participant had to go to the other end of the ward, which wasted time.

A concern was noted that related to the social aspects of working in a team. One participant stated that ‘nurses eat their young’ and mentioned they would not want to misdirect a colleague in using mobile technology, even though they themselves were an advocate of its use:

The “nurse eating their young” stereotype is real. It doesn’t matter if you’re a supervisor or CE [clinical educator], you’re still a member of the team and social issues definitely come into play…. [when encouraging
mobile technology with another new graduate]… I wouldn’t want the new grad to follow advice from me that another nurse would pull them up on (FGI 5).

Participants’ displayed a pattern in the responses that demonstrated their adaptability in the use of mobile technology. Again, it was the presence of supportive or non-supportive senior nurses that were influential: “…some staff would not mind if you used mobile technology but others would assume you were using it for non-work related thing… most likely though usually who is working on the floor (FGI 1)”. To clarify this aspect, the researcher sought more information on potential differences between peers and senior nurses influence: “Mostly peers, and then depending on what supervisors are around… it is clear that depending on who we work around, and where we are, is influencing our use of mobile technology (FGI 1)”.

The inconsistencies in directing use of mobile technology were further demonstrated by one participant, who highlighted the differences and inconsistencies within the same team on the ward:

The nurses around me influence my technology use. I'm lucky in the fact that my clinical educator encourages us to always look up policies and use these to guide our practice. But other nurses particularly some of the older ones don't necessarily believe in the use of mobile technology and almost assume that if they tell you something then you won't look into it any further (FGI 4).

The inconsistencies that existed between senior staff and peers, was most pronounced between younger staff and senior staff. This may have been related to the methods used in the training school of senior nurses, where it has only been in recent years that mobile technology for undergraduate education has been introduced. One participant noted that senior staff were not using mobile technology. This may be related to how senior staff learnt themselves:
My supervisors haven't really influenced my use of mobile technology, apart from my CE [clinical educator] a lot of the other nurses I work with are very experienced and I haven't really noticed them actually using mobile technology apart from note writing (FGI 4).

A number of suggestions were provided by the participants, to improve mobile technology use in the clinical areas. This included a need to be supported by an overall hospital response. This may include changing perceptions of the older or senior nurses in the use of mobile technology for new nurse graduates for example.

**Support from hospital.**

Lack of consistent support from the hospital was identified as an influencing factor in the use of mobile technology. One participant identified that the use of mobile technology use could be included with other annual mandatory competencies that nurses are required to undertake: “…perhaps at orientation the mobile technology policy could be a requirement to be read, just has hand hygiene, manual handling are all competencies that are required. Clear understanding of whether or not you can use mobile technology (FGI 1)”. This was an interesting comment, as the participant knew that a policy and guideline existed at only one hospital site in Perth metropolitan area, but she had not been able to gain access. This highlighted an overall pattern that information on this issue of mobile technology use should be available for all staff: “I think there would have to be lots of education sessions throughout the hospital so everyone was aware that the use of mobile technology was encouraged and accepted (FGI 2)”. This example of increasing awareness of policy and guidelines implies that the overall culture within the clinical area may need to change.

A change in hospital culture and staff acceptance was further highlighted as one of the most important issue discussed in the interviews. A number of participants simply stated: “Staff education and acceptance” (FGI 3). For one participant, when they were asked a question regarding a negative example of mobile technology use, noted support was needed from the hospital: “Negative example is just being referred back to the hospital resources instead… They are always harder to access as there are not enough computers available when needed (FGI 3)".
There were some positive examples of the emerging trend in staff to the use of mobile technology. For example, one participant commented that: “The workforce is getting younger. The benefits are beginning to outweigh the negatives. As younger staff are attaining more senior positions, the tide is turning on the use of mobile technology (FGI 5). As younger staff enter the workforce and guide change: “I think support for mobile technology is gaining momentum though so that’s a positive (FGI 5)”. However a need for ongoing: “…support from hospital executive and senior staff (FGI 5)” may be required. In regards to transitioning from the University to the clinical settings using mobile technology and gaining staff acceptance: “[University] I feel it was a great start for my use of mobile technology. I just feel there needs to be a change of thinking at the coal face (FGI 3)”.

One participant, offered a potential solution to the lack of hospital support:

Overall I think if each nurse on shift had an allocated tablet that gave them access to their patient’s documentation, it would make nursing care a lot easier - real-time note-taking, access to medication fluid or falls charts, maybe a timetable app with alerts? and of course access to hospital policies, and search tools (FGI 5).

One final comment suggested that there may be issues with staff unprofessional behaviour in regards to mobile technology use, but as the majority used them professionally, then they should be supported:

The problem with mobile technology in the clinical setting is that there will always be someone who wants to show ‘cat videos’ but it's such a useful tool that the majority of people who would use it appropriately should be allowed and encouraged to (FGI 2).

Stage five of this qualitative phase of the study, identified the perceptions of graduates in regards to factors that may have influenced the clinical use of mobile technology. The following stage is concerned with describing the nurse leader’s perceptions of graduate’s use of mobile technology.
Stage six
The aim of stage six was to investigate nurse leaders’ perspectives of mobile technology in clinical settings, as it was clear such people influence its use. These nurse leaders included nurse coordinators, educators and managers of graduate programs. This final stage incorporated the administration of an open-ended survey and its subsequent analysis providing links to the findings from stage four and five. This stage incorporated recruitment of the participants; data collection; and thematic analysis of the transcripts. It was important to identify the perspective of nurse leaders as they may have sometimes viewed issues differently from front line nurses (Casey & Krueger, 2009).

In order to gauge the roles and responsibilities of the nurse leaders, the Job Descriptions were voluntarily provided. These descriptions indicated that nurse leaders responsibilities may have included: coordination of the graduate program; ongoing development and monitoring of graduates progress; an orientation role; sourcing resources for professional development; supervision; liaison roles; support; facilitation and planning of learning; recruitment and marketing; and ongoing performance management. Based on these descriptions the final research question asked: ‘What are the perceptions of nurse coordinators, educators and managers of graduate programs, regarding mobile technology use in the clinical setting?’

Recruitment
To maintain consistency throughout the phases of the study, the sample selection of participants for the open-ended survey were purposefully sought from the hospitals identified in Phase 1 of the study. An invitation was forwarded via email to the respective potential participants (see Appendix 16). Graduate program nurse
coordinators were initially contacted via the telephone, followed by a formal email to remind them of the study. The researcher also encouraged forwarding the invitation to other staff within their team who directly supervised, educated, or managed registered nurse graduates. An email contained the survey hyperlink information about the study, in the form of the Participant Information Form for each specific hospital site, and the contact details of the researcher (see Appendix 17). Consent was implied through completion of the survey, as advised in the initial email and at the start of the survey. A total of twenty four online open ended surveys were distributed, with seventeen being completed in full.

**Data collection**

To maintain consistency within the study, the focus group interview questions used with the graduate participants, was adapted for the online open-ended survey with the nurse leaders (see Appendix 18). It was further reviewed and refined based on the graduate participant’s responses.

In order to become familiar with the survey responses, all data was transferred into a Microsoft Word® table and read and re-read a number of times. During this process, it was noted the data required cleaning, two responses were inaccurate. These two participants misread the instructions on the survey that referred to the definition of mobile technology as any portable devices, such as smartphones, tablets and iPads. These participants referred to mobile technology as the current fixed ward PCs. Subsequently these participants were removed from the analysis of the data.

Patterns and trends were identified from the transcripts until a saturation point was achieved (Polit & Beck, 2014; Schneider, Whitehead, Elliot, Lobiondo-Wood & Haber, 2012). Although a saturation point was achieved early, it was noted that inconsistencies occurred between participants with particular questions. Thus, the researcher analysed all data, to gain additional understanding of these inconsistencies. The emerging themes and subtheme were collated to form the concept maps as explained in the examples earlier in this chapter.
To enhance credibility of this phase, and following the data analysis, a final question at the end of the interview asked participants if they would consent to being contacted via email to review the findings (see Figures 69 & 70). Thirteen participants consented, but only four participants, responded. These participants supported the findings and provided positive feedback on the presentation and layout of the themes and subthemes.

**Themes and subthemes from open ended survey**

Ten broad themes emerged from the analysis of the data. These themes were then defined and named into a final concept map (See Figure 69). A separate figure diagram illustrates the final themes and subthemes (see Figure 70). Participants provided their perceptions on graduate’s use of mobile technology, and included their personal use in the clinical setting.
Figure 69. Stage six final concept map sample with potential themes combined into themes/subthemes
Figure 70. Final themes and subthemes from the qualitative open ended survey to nurse coordinators, educators and managers of graduate programs

**Point of care resource.**

Once again there was similarity between graduates and nurse leaders concerning the use of mobile technology as a point of care resource. The findings from the survey administered to the nurse leaders provided further evidence in addressing the second
research question, regarding the extent and ways in which graduates currently use mobile technology in the clinical settings.

The majority of the responses from the participants reflected the usefulness of mobile technology at the point of care for new graduates and for themselves. For example, one participant stated: “I believe it is extremely important to support the graduates with on the spot information that is relevant and correct (OES 14)”. Another confirmed this view, when they stated: “Mobile technology could certainly assist the graduate nurse with their ability to access and interpret information at the point of delivery in a timely and meaningful way (OES 3)”. In regards to the information accessed and improving safety, one participant suggested that an iPad (property of the hospital) would be better over the graduates’ own device:

It would be of benefit if the new RNs could have easy access to an iPad when they are doing their early medication rounds to quickly and safely look up unfamiliar medications instead of guessing or leaving the medications until they found a book to look them up. Other technology would be a hindrance distracting them from the focus which should be the patient (OES 22).

When graduate commenced a new clinical rotation, there is often new medications to learn, particularly on speciality wards. One participant mentioned that: “When moving to a new setting, graduates are eager to learn about new medications and mobile technology makes this so much easier for them (OES 7)”. A similar comment was made in regards to differences in specialities, and relevance of use of mobile technology at the point of care: “The use of mobile technology is very relevant particularly as we cover a variety of specialties in the Post Anaesthetic Unit - it provides a fast method to access information (OES 12)”. A similar response at the point of care during medication administration, concerned: “Using Mobile Technology and AMH [Australian Medicines Handbook] to ensure correct drug etc when doing medication competency and rounds (OES 13)”. This resource can be accessed in University settings, and online through some hospital libraries. One participant stated:

Positive example = Graduate nurses accessing mobile phones at the bedside in order to look up uncommon medications (I think the hospital
should give every nurse free access to an approved app like MIMS or AMH to ensure they only access good quality information), it is far quicker and they are more likely to double check if they have the resources right at the point of care (OES 20).

When discussing the relevance of mobile technology use by graduates at the point of care, one participant stated how essential the resource was to access the internet and resources: “In fact it is sometimes essential that graduate nurses use the internet access on their mobile devices because they cannot access useful websites/apps via the hospital generic login (they don't have the access privilege)(OES 20)”. Another trend was noted that a number of participants also used personal mobile technology, as they had difficulties accessing through current systems. For example:

I use my mobile phone for internet access at work because the internet at work is slow and hard to access if using a shared computer with a generic log in. Sometimes useful resources are not on the intranet and I need to access them either at the bedside or away from my office, so I would use mobile technology then also (OES 20).

In relation to the point of care resources, one participant confirmed: “Mobile technology is relevant for graduates, as it provides opportunities for them to access information regarding their patient's medications, tests, diagnosis etc (OES 16)”. In addition, specific examples of point of care resources used and encouraged were provided by one participant: “palliative care resources, ABG [Arterial Blood Gas] interpretation, AIRVO demonstration app [Respiratory device] (OES 14)”. One clinical area also encouraged its use within the graduate program structure:

It's very relevant. I see that graduates use mobile technology to access different types of apps such as drug calculation and use it as resource to find out information about a procedure or a medication they are unsure of. They also use it to access their graduate work books and required hospital education (OES 18).

Perceived time saving benefits of using personal mobile technology devices at the point of care, was identified and was preferred over ward based PCs.
**Time efficiency.**

When asked ‘what’ influences new graduates clinical use of mobile technology, one participant stated: “a desire to get current info in timely manner (OES 23)”. Another similar response was: “The advancing of technology, the cutting of time, technology enable to make looking something up quicker (OES 21)”. Similarly: “The speed of the internet and the calculators on smartphones cuts the time it takes to administer medications and check what medications are for and correct doses (OES 7)”.

The responses highlighted in that graduates were under time pressure, and that mobile technology assisted in access to education and resources at the point of care. For example: “It supports the ability to have access to education & MIMS online to graduates that are under time pressures (OES 21)”.

Some of the hospital sites utilise portable tablet mobile technology for ongoing graduate education and resources. Participants noted these resources were very useful at the point of care with graduates: “Very useful, as it enables us to provide ‘in the moment education’ at any given time. Using iPads, for example to review a rhythm strip, is fantastic (OES 16)”. Having less time and resources, participants found portable mobile technology useful for flexibility of educational sessions within the clinical area. This was supported by participants saying: “Very useful especially seeing time for education has been significantly reduced we use iPads and laptops to deliver education on the go, even 5min presentations throughout the nursing staffs shift (OES 21)”. A further example of a benefit to the graduate’s time management at the point of care was: “Mobile technology such as iPads so technology is with the Grad it complements their ability to maintain time management (OES 21)”.

In contrast to the perceived time saving benefits, some participants found that a barrier to the clinical use of mobile technology by graduates, was a: “Lack of time and opportunity. They need to gain confidence interacting with patients and problem solving using critical thinking skills e.g. do I have a deteriorating patient? Should I call a MER [Medical Emergency Response]? (OES 22)”. In addition, another participant stated mobile technology use could be perceived as actually wasting time. For one participant, the most important thing that related to the use of mobile technology in clinical settings was: “Not overusing it and getting distracted and
wasting time. You do not need an instant answer to every query. Some things you can make a note of and look up later. Be selective and prioritise (OES 19)”. This example highlighted patterns of inconsistencies and discrepancies between participants in some of their responses. It highlighted the difference noted in the graduate’s responses, who commented that they valued instant access to information and resources to improve care and save time.

Subtheme-Preferred over ward PCs.

A related subtheme was identified under the theme of time efficiency. Participants indicated that graduates would prefer the use of their mobile technology over the existing ward PCs. One participant noted that graduates used personal mobile technology frequently for medication administration resources, as challenges existed when trying to access existing ward PCs: “New RN graduates access MIMS online continuously and it is much easier and quicker for them to use mobile technology to do this. Wards generally only have one book and the computers are always hogged by medical teams (OES 3)” A similar response was confirmed by another participant, when noting their own experiences when trying to access ward PCs:

Mobile phones would be great in the wards because you can look up medications for example in an area such as the medication room when there in not a patient around. I remember working in the ward and it was hard to find a computer to look up information I needed to know urgently (OES 1).

In response to a question in the survey, concerning ‘what’ influences mobile technology use within the clinical setting, it was noted that participants found it was easier to use personal mobile technology at the point of care. For example: “getting access to computers; being able to access information at the bedside (OES 3)”. For the same question, another participant stated challenges existed in simply accessing the internet from existing ward PCs: “No access to the internet on generic log in ward/ shared computers - The wealth of resources online that they may want to access at the bedside (especially for looking up medications) (OES 20)” . Another example, in answer to the question, one participant found that mobile technology use in clinical areas is: “Incredibly relevant, most people have their mobile phones
readily accessible at all time and I can see the potential of this readily accessible mobile technology in providing education at the bedside (OES 20)”.

Some participants preferred the graduate to only use the existing ward PC: “If they are wanting to look up a procedure or medical term. They should have internet access to look this up on the computer (OES 1)” One participant offered a solution to this challenge:

A positive example could be the use of a tablet that can access the nursing practice guidelines at the bedside instead of having the graduate access the intranet on a ward computer and then printing it off to bring it to the bedside - save time, money and trees! (OES 3).

**Inconsistencies-useful/not useful.**
Throughout the analysis of the data from the nurse leaders, a pattern of inconsistencies emerged. These included whether nurse leaders perceived mobile technology use for graduates as useful or not useful; whether they supported its use; and whose role it was to provide direction for graduates in its use. These inconsistencies may have led graduates to covertly use of mobile technology. In addition, a lack of clear guidelines or policies across the sites may have added to confusion and discrepancies in the graduate’s use of mobile technology. This situation may have created a gap between theory and practice, if nursing graduates familiar with the use mobile devices to access resources in University settings, are not able to use them at the point of care.

Some participants highlighted the benefits of personal graduate’s use of mobile technology at the point of care. A common response to the question that asked: How 'useful' is mobile technology for your role in the clinical setting, when supervising/managing/educating new RN graduates? was: “Mobile technology for education is imperative, whether it is mobiles, or tablets (OES 16)”. As an educational tool, it is: “very useful, can demonstrate things to the staff (OES 14)”. One participant used mobile technology in a similar manner to graduates when accessing evidence based resources: “I find the use of mobile technology very useful and have frequently used it myself when trying to recall/refer to evidence based research and to point students to useful… (OES 12)”.
Mobile technology was considered useful in the specific role as a coordinator for administrative and management benefits: “For my role as coordinator, I find the tablets useful for accessing information in meetings, having the ability to record / minute conversations or meetings and having an electronic diary to coordinate a busy schedule (OES 3)”.

A surprising and unexpected finding was noted from one participant, who encouraged use of the computer on wheels (COW’s), and still advocated use of personal mobile technology in the clinical area: “I set up the three computers on wheels for initial med rounds, access to policy and procedures etc and feel staff should be able to use smart phones for work related apps etc (OES13)”.

In contrast, other participants stated mobile technology was not useful: “Not very useful… I use out hospital intranet mainly and access via a work station on the ward (OES 19). A similar response was:

[Not useful]. Mostly I have time to take the graduate nurse to my office to look up policy on how to perform a task, e.g. take out a drain. Often if I am teaching a new skill e.g. needling an infusaport I have the equipment in my office for simulated practise (OES 22).

Another participant stated mobile technology was: “not as relevant as we tend to teach using standard PP [PowerPoint®] and PC’s (OES 2)”. The response seems to suggest incongruence between what the graduates indicated in their survey and focus group. Evidence from the graduates, suggested they used their personal mobile technology covertly, depending on who was present at the time. It was noted from their responses, they only used the resource in front of supportive staff or supervisors. A nurse leader who appeared unsupportive of mobile technology use stated:

Again the need for such devices on the floor when working/teaching our new graduates on the floor is I feel overrated. There is an over reliance on the need for instantaneous information which limits the skill set of developing a critical mind able to problem solve and think outside the box (OES 15).
Furthermore, when participants were asked what influences graduates to use mobile technology, one participant stated: “Habit, over reliance on technology (OES 15)”, with another’s response to the question- What is the most important thing that relates to the use of mobile technology in clinical settings for new RN graduates: “Not overusing it and getting distracted and wasting time…You do not need an instant answer to every query (OES 19)”. These examples highlight the challenges faced by graduates when inconsistencies were noted with nurse leaders. Based on the participant responses, clear inconsistencies were noted where some participants found mobile technology useful and supported its use, whilst others did not.

**Flexible education/learning.**

One clear theme emerged, that most participants supported the use of mobile technology as an educational tool for the flexibility it offers in learning: “Another great use is to record the guest speakers presentation so it can be delivered in busy clinical areas when the staff get a free amount of time they can catch the presentation on the iPad (OES 21)”. This example was based on one hospital site using specific iPads supplied by the organisation for supporting education.

Flexibility of learning was a common theme from the nurse leader’s responses: “Very useful, as it enables us to provide 'in the moment education' at any given time (OES 16). Mobile technology provided flexibility and time saving benefits: “good for accessing 5 minute education sessions – PPs [PowerPoint's] (OES 2)”.

Flexibility of learning with mobile technology potentially becoming the way of the future: “Education on the run is the way the future is heading and without mobile technology it would be very hard to deliver evidence based education to the caregivers in the clinical setting (OES 17)”. Ongoing benefits of mobile technology use was noted for education and ease of use:

It’s very useful. It is a much quicker way to get information to the graduates, it’s relevant to the way they are used to learning. I find that I can access and use a wider range of education resources. It’s great for this quick on the spot education needs, you can quickly wipe up a power point or access a program that has already been written. It saves time (OES 18).
It was noted from the participant responses, that although some innovative hospital sites used portable iPads for delivering education with the graduates, a number of issues regarding support systems and resources were concerning.

**Limited support-systems/resources for use.**

Even when mobile technology initiatives such as clinically supplied iPads were used with graduates, challenges were noted. These limitations were associated with limited support systems: “The iPad internet connectivity is poor, when completing an audit sometimes you have to restart due to the internet cutting out (OES 20). Although benefits were noted, more devices were required: “We also only have one iPad for shared use of the whole ward (OES 20)”. One participant stated that even with access to portable mobile technology for use with the graduates, there are ongoing challenges with the devices within the clinical setting:

We do have access to tablets which can enable us to complete office tasks on the go but these are bulky, expensive and cumbersome at the bedside. We also run the risk of theft as these must be secured if left unattended (OES 3).

A common pattern emerged from nurse leader participants, that although most hospitals had access to the internet, it was considered very slow and some online resources were inaccessible. Again, these challenges lead graduates to use their personal mobile technology. A potential solution suggested by a participant was for Wi-Fi internet access to be provided by the hospital: “having free Wi-Fi (OES 2 & OES 3)”. A potential problem, however, was: “the cost of acquiring such devices through a limited procurement contract with limited financial resources (OES 3)”.

One participant referred to a risk of interference with other electrical equipment if mobile technology was used but was unsure if this would be an issue within the clinical area: “interference with other technology?? (OES23)”. This response provides further evidence of the inconsistencies associated with the lack of clear guidelines or policies regarding safe use of mobile technology.
Familiarity with device and ease of use.

When nurse leaders were asked what factors influenced use of mobile technology, it was suggested prior knowledge and ease of use was a factor. Ease of use could be linked to University education, where appropriate online resources and evidenced based information was learnt. In response to the question, one participant stated: “I guess their affinity with their device. Their knowledge of appropriate online resources and their ability to distinguish between creditable and non-creditable sources of on line information (OES 19) and they’re: “ability to navigate around sites (OES 23)”.

In addition to being familiar with mobile technology, another participant suggested it was part of the culture from school, to University, and now the clinical setting:

It’s a culture, it’s what they have been using throughout high school and University. It is technology that they understand and can work through quickly. It pretty much is the first port of call when they need to communicate or access information (OES18).

The nurse leaders perceived that graduates found mobile technology easy to use: “ease of use - very familiar with the equipment (OES 11)”. As mobile technology was easy to use, this was a factor that influenced their use: “Their own determination is pretty much the only thing enabling the use of mobile technology, I would say mobile technology is not being used to its full potential in our workplace (OES 20)”.

Influence of others.

The perception of role modelling was also considered a factor that influences graduates use, where: “We all do. If we are sending emails, setting up programs on line, putting required education materials online, policy and procedures online and giving them no other alternative to access information or communicate then we are the biggest influence (OES 18)”. Role modelling with mobile technology also appeared to extend to social media use in graduates where:

As an SDN I encourage the use of mobile technology and have an agreement with the Grads not to abuse same. I remind them it is a not a
good idea to friend me on Facebook as I will see if they are using social media on a late shift :) (OES 13).

Role modelling may have influenced the graduate when the educator or supervisor was seen using the device: “I use my mobile phone for work on a daily basis, it is proving to be the most efficient way of contacting other wards, line managers and the WASON [Western Australian School of Nursing] building where all the education is centred (OES 7).

In addition, peers may influence graduates use. One participant perceived that: “RN graduates would likely influence each other as well, if someone finds something useful they share with their colleagues (OES 20)”. In addition, “everyone is doing it (OES 23)” along with “peers (OES23)” influencing its use.

One participant stated that although younger graduates are familiar with mobile technology and accessing resources, they may experience challenges:

The millennial generation also plays a role, technology is what they know and what they live by. I’m sure they would struggle if they had to research topics or complete education by hand and only looking up books in a library (OES 18).

A similar response on the impact of culture was: “Society in general. Being told or sold the idea they cannot function without the devices (OES 15)”. It was noted that not only peers influenced their use, but: “The culture of the clinical unit or hospital (OES 19)”. Referring to hospital culture, it was noticed that technical strides lagged behind: “Attitudes within hospital cultures have not kept pace with technical developments in this area for nursing staff. Doctors and other health care professionals use them regularly (OES 19)”.

When asked the question in the survey: ‘What are the 'enablers' for new graduates to use mobile technology in the clinical setting? one participant said: “feeling empowered to use device while in clinical area (OES 2)”. This suggests support and encouragement from other staff was a factor that influenced its use. Another participant stated a similar response: “Feeling empowered to use their mobile device when appropriate without getting told off by staff (OES 2)” and:
“seeing other staff using mobiles to access information (OES 2)”. The influence of peers was highlighted by another participant: “How receptive staff are. I firmly believe that the new generation of nurses will benefit greatly with positive encouragement to use mobile technology (OES13)”.

In contrast to empowering staff to use mobile technology, it could be discouraged by others: “I have found the perception of engaging with mobile technology among nurses to be a barrier too, they often assume if you are on your phone then you aren't being productive (OES 20)”. A potential negative use of mobile technology was identified by one participant as: “…be seen by patients, visitors, other staff as being inappropriate - should be attending to patient care rather than 'playing' on phone (OES 23)”.

The influence of others in the use of mobile technology included Nurse Unit Managers (NUM). Discrepancies were noted in who guided its use for graduates and provides further evidence on the need for clear policy and guidelines. One participant stated:

My nurse unit manager and I allow nurses to carry their mobile phones on the ward but they aren't allowed to use them in the corridor, we only ask that they be discreet when they use their phones and duck off to a private area, or explain to the patient why they are using their phone if doing so at the bedside (OES 20).

Although in the above response, the NUM and the participant allowed the use of mobile technology in their area, others may not have been as flexible. This situation could have created potential inequity between staff, and lead to covert use by graduates. Where on one ward they could use their device, but in another ward they could not. This pattern is identified in the following example where a fear of misuse was noted:

Some NUM's are against staff carrying their mobile phones when out on the wards due to the fear of misuse. If they see other staff using their mobile phones for the calculator or MIMS online then they appear to be more comfortable in their use (OES 7).
The example relates to mistrust of the personal use of mobile technology, as its use could be seen as engaging in unprofessional behaviour, until the staff member ‘proves’ they are using it appropriately.

When asked ‘who’ influences graduates use of mobile technology, it was governed not only at ward level by the NUM’s, but also from the graduate program staff. For example, the: ‘SDN [Staff Development Nurse]; myself and the ward CNS [Clinical Nurse Specialist] / CNM [Clinical Nurse Manager] / NUM have governance of this (as we would their clinical and professional practice) (OES 3)”.

A guideline existed for the safe use of social media, but few policies or guidelines existed for the use of mobile technology in clinical areas. This theme was highlighted when participants identified a need for a consistent approach to guidelines or policy.

**Need for consistent policies & guidelines.**
The result of no clear guidelines or policies to guide mobile technology use, can lead to inconsistencies and discrepancies in clinical areas. When participants were asked - what is the most important thing that relates to the use of mobile technology in clinical settings for graduates: “Guidelines and consistency across sites (OES 13)” seemed to be highlighted.

Further evidence of the discrepancies between the sites and clinical areas was identified by the participants when asked ‘How does the hospital guides/direct the use of mobile technology in the clinical setting for graduates?’: “No guide in place at this stage (OES 21)”; but another had: “hospital has guidelines for mobile use (OES 2)”. Despite a lack of clear guidelines or policies, one participant promoted its use within their educational role: “I don't think there are clear guidelines apart from social media; As SDN I promote the use of mobile technology (OES13)”.

Another participant stated that it is: “not provided to new graduate nurses (OES22)”.

With no clear guideline or policies available, ongoing confusion about whether to use or not use mobile technology, may occur for the graduate and others. Some hospitals and other health industry organisations actively promote apps and other online resources for staff and general public use. It would appear, however, that no
guidelines existed for their appropriate use in clinical areas. An example online resources accessed from mobile technology was provided by one participant who stated: “there are now some online apps used by the hospital and publicised for general use (OES 14)”.

Some clinical areas were more specific in guiding mobile technology use, but it was not clear if there was a policy or guideline. For example, one participant stated that although it was not allowed, they could see potential benefits within the area: “Mobile phones not allowed in operating theatres. If mobile phones were allowed in theatres it will be easier access to information on surgical procedures (OES 1)”.

**Inconsistencies-Who guides use.**

When participants were asked ‘who’ influences graduates use of mobile technology in the clinical setting, participants responses were varied and demonstrated significant inconsistencies. Such inconsistencies could have been related to the lack of clear guidelines/policies, or the personal preference of nurse leaders. Either way, graduates could be confused, leading to the covert use of personal mobile technology.

It was noted in the responses, however, that some of the sites were quite specific in guiding use of mobile technology as soon as the graduate commenced employment with the hospital. For example:

During orientation we inform the graduates of the relevant policies and operational directives (it is also in their handbook). We then ensure the ward has this conversation with them regarding the ward use of personal devices and those provided by the ward (OES 3).

At a different site, another participant informs graduates at orientation that its use is not allowed as a point of care resource:

All graduates are informed at orientation that mobile phones are not to be used for day to day activities on the ward, i.e. Checking Facebook and other such social media sites, making phone calls/text messages that can wait until break time and sending of emails etc (OES 7).
Clearly, this participant did not see the use of mobile technology as a point of care resource. Although some sites advised graduates during orientation about mobile technology, it also appeared to be based on some nurse manager’s preferences in guiding its use: “Clinical Educators, Nurse Managers, and Clinical Nurses- it depends on the nurse manager’s preferences for his or her department (OES 21)”. This statement demonstrates that mobile technology appears to be governed at the ward level: “the staff member is not advised to use their personal devices in the clinical area. This is governed at the ward level (OES 3)”. Further evidence of the discrepancies at the ward level, was that the same nurse leader would change directions in the use of mobile technology at different times. This example highlights that mobile technology use may depend on who is around at the time on the ward. For example: “Most graduates will access their personal devices during scheduled breaks or in situations endorsed by their ward based supervisors (OES 3)”. In contrast however, another participant remained neutral to the use of mobile technology: “I would only respond if I thought there was a problem or issue. I don't proactively promote or disparage the use of mobile technology (OES 20).

When participants were asked how does the hospital guide/direct the use of mobile technology in the clinical setting for new RN graduates, one participant stated: “It doesn’t. Currently Nurses are not allowed to carry personal mobile devices when on the floor (OES 19)”. A similar response identified that the hospital does not guide or direct its use and that it may be directed by different staff: “…apart from being directed to educational apps and websites by other educators I don't think the hospital on the whole guides/ directs the use of mobile technology (OES 20)”.

For the same question at another site, a participant stated that although they promote online access, they do not want the graduates to have the devices on them:

This is really hard to police because we need to treat them like adults and hope they are following the rules, we are too busy to walk around checking to see if they have left their phones in their bags. It’s a catch 22, we tell them to access things online but we don't want them to have devices on them (OES 18).

To further highlight inconsistencies in who guides mobile technology use, participants were asked “What is your role in regards to guiding/directing use of
mobile technology clinically?: “I highlight accessible resources that may benefit them (OES 14)”. Where another participant, in contrast stated: “No direct role (OES 2)”. It was identified by some participants that they preferred that graduates access mobile technology for education, but outside the clinical area: “It is a great tool for education, however, outside the clinical area where patients need to be the number one focus (OES 15)”. It may be that this participant either did not agree, or had little idea about the benefit of mobile technology at the point of care.

Participant’s noted perceived benefits and challenges to the clinical use of mobile technology. Relating to these benefits and challenges, was a lack of hospital support that influenced graduates and nurse leader’s clarity in the clinical use of mobile technology.

**Support initiatives.**

Most participants supported for graduate’s use of mobile technology. Motivation to embrace the resource because of the potential benefits was a common pattern. For example: “I am a big supporter of mobile technology and the good that it can do. I think that if we focus on the good and use positive reinforcement we can embrace this technology and encourage correct usage (OES 7)”. An interesting response was noted from an older nurse: “I think it is wonderful. I am in my 60's, nursed for over 40 years. We need the most up to date research, IT and devices (OES 13)”. A suggestion for more portable devices was made by some participants such as: “I believe we should have secure access to iPad that would be available in each section for the new grads to use (OES 22)”.

Graduates may face challenges in accessing consistent information at the point of care as policy/guideline accessed online may different from hospital policies/guidelines. From a University setting, however, nursing students are encouraged to analyse, evaluate and critique evidence and information online. One participant referred to a negative of mobile technology use in clinical settings, surprisingly as: “using google to look up policies (OES 13)”. Another participant stated: “The biggest negative I have is that we are presuming that each RN graduate has the ability to access and understand technology… we are guessing that they are
understanding the information they are reading (OES 18)”. This example suggests the participant may not have kept up-to-date with educational goals for graduates in University settings.

Some participants felt positive about providing support in terms of mobile technology to nurses, but not surprisingly they had a more macro perspective:

I would embrace any form of device that can improve the delivery of quality and efficient health care without compromising the integrity of the system, the individual and most importantly the patient. The ongoing challenge is finding something that is cost efficient that can accommodate the needs of a large workforce operating within a limited IT system (limited capabilities and resources) (OES 3).

Encouragingly, the same participant felt that graduates practiced using mobile technology appropriately: “Separating personal from professional use is the biggest hurdle for some. Our graduates generally are aware of the risks associated with using personal devices and practice within our parameters (OES 3)”. It was noted, however, no policies/guidelines exist at the participant’s site for the use of mobile technology.

Some participants suggested practical support in the form of the: “Graduate being provided with access to a free list of approved mobile apps to use on their mobile phones, so that the hospital can be assured they have provided nurses with quality resources (OES20)” . One participant stated a need for: “consistent sites and common apps (OES 11)”. Another example of support was: “clinical education support (part of a learning program) (OES 11).”

Mobile technology use was seen by some participants as a ‘fait accompli’ for the future:

I really feel that whether we like it or not, graduate nurses will be engaging with mobile technology in order to provide care - we as educators need to respond to this and set our graduate nurses up for success (OES 20).

In addition, a similar response was noted: “Mobile technology is unstoppable - it is the future, it is better to understand it (and its limitations) and to actively engage with it in order to get the best outcomes for our patients (OES 20)”. Another participant
felt that: “I think that we need to accept that there is no going back, technology is only going to become a bigger reality on the floor so we need to find a balance (OES 18)”.

As a future resource for care, mobile technology use was seen as important tool. It was also noted that current systems needed updating. For example: “When we have a paperless system there will be a lot more mobile devices that will be available (OES22)”. Another participant clarified this view: “If we are heading into the technology age then having better and more resources for the RNs to use and the educators to access as well (OES 18)”. A need for progress was noted as: “I would rate our hospital internet and mobile technology as very behind the times (OES 20)”.

An overall hospital approach in regards to the need for support initiatives was a pattern in the nurse leader’s responses: “To inform all staff that the use of mobile technology can be used for good, such as medication checking, calculators, translating apps. Education for the NUM's regarding mobile devices (OES 7)” A further recommendation from one participant was: “Maybe posters designed to inform visitors and patients that these devices are being used for appropriate professional purposes (OES19).” This suggestion was seen as keeping people cognisant of mobile technology.

Another overall response for clarity in mobile technology use was related to attitudes of staff. An overall support initiative may involve addressing the culture and attitudes of older staff in clinical areas for example. Participants suggested that the ‘enablers’ to mobile technology use included: “The attitude of the hospital management/ directors; Hospital Policy; The attitude of the NM towards technology in the workplace; the attitude of colleagues (OES 19)” “Old attitudes (OES 13)” highlighted by one participant, was seen as a barrier to its use.

In order to reduce the potential discrepancies and inconsistencies, one participant suggested that there should be more collaboration between industry and the universities. The participant felt that graduates needed to be mindful that healthcare providers were behind in the technological world and that this issue may be associated with financial constraints. Moreover, she felt they also had to be aware
of the risks associated with mobile technology, although the participant did not elaborate further:

There could be more collaboration between industry, the ANF and the universities to make students more aware of the risks associated with use of mobile technology (particularly personal devices) in the clinical setting. Health settings will always fall behind the rapidly increasing (and expensive) IT world and whilst desirable to have access to the advances in technology, the reality is we will always be steps behind (for a variety of reasons) and as such, graduates need to expect that and function within those constraints (OES 3).

This final stage of the qualitative phase of the study provided the perceptions of nurse coordinators, educators and managers of graduate programs, regarding the clinical use of mobile technology. Whilst there were similarities between the graduates’ perspective and the nurse leaders there were also unique themes that related to the role that these people played in directing graduates.

**Conclusion to the chapter**

The qualitative phase of the study, involved three key stages to assist in answering the research questions. Stage four involved thematic analysis of the text-based responses from the quantitative phase of the study. The themes provided data for the development of the questions for the focus group interviews and provided a link between the quantitative and qualitative phases of the study. Stage five, following data collection from the focus group interviews thematic analysis, uncovered a number of themes and subthemes to assist in answering the first and second research questions. Stage six involved posing questions to nurse leaders regarding graduates clinical use of mobile technology. It was deemed necessary to investigate the perceptions of these nurses since they were often the people who directed graduates on the wards. Responses from the nurse leaders assisted in answering the third research question.

Findings from this qualitative phase of the study indicated similarities in themes between graduates and nurse leaders. There were also inconsistencies and discrepancies in the use mobile technology. A major theme identified by both sets of participants was that mobile technology was useful and relevant at the point of care.
They also noted that mobile technology was easy to use and saved time. Most participants also added that mobile technology use was preferred over ward PCs. Graduates were consistent over the issue of their covert use of personal mobile technology as an issue that may have been related to the lack of support from the hospital in terms of policy and guidelines and/or from nurse leaders who generally followed their own rules. Thus, these problems created inconsistencies and mixed messages to graduates in the clinical use of mobile technology.

Throughout the qualitative phase of the study, it was important to ensure the trustworthiness of the findings. This is discussed within the following section.

**Rigour and Trustworthiness**

As the study utilised multiple sources of data, both rigour and trustworthiness of the findings was essential. In qualitative research the term trustworthiness is used to describe the strategies used to ensure findings can be trusted (Streubert & Carpenter, 2011). The operational terms that describe this process are credibility, dependability, confirmability and transferability (Lincoln & Guba, 1985; Shenton, 2004; Streubert & Carpenter, 2011). These terms are discussed in the following narrative to how they were applied in this phase of the study.

Credibility involved activities that increased the probability that credible findings were produced. Prolonged engagement with the participants was considered evidence of this concept (Streubert & Carpenter, 2011). Since the collection of data in the study was predominantly online, this concept was difficult to achieve. The following steps, however, were undertaken to demonstrate credibility and achieve neutrality: personal and professional values when collecting and analysing data were discussed with the researcher’s supervisor; the supervisor checked journal entries and processes used in analysing the data; and participants were provided with a copy of the transcripts and findings on request. Credibility of this phase was demonstrated though the following example. At the end of the qualitative online text-based focus group interviews and open-ended survey to graduate program supervisors, managers and educators, the following statement was included:
‘As mentioned previously, please select 'yes' below if you are happy for me to contact you via email following the data analysis to review the results for credibility of this phase. This would simply involve an email with a summary of the results for you to provide brief comment and feedback. Thank you again for being part of this important research so far.’

Dependability refers to the extent to which the findings of the study are dependable, which is comparable to validity and reliability demonstrated in the quantitative phase of the study. The explanatory, sequential, mixed method design when collecting the data, was considered an appropriate method to achieve dependability. In accordance with this recommendation, the researcher followed a routine of analysing data by comparing across the different responses. This process was particular relevant in moving between phase one and two of the study and between the different data sources. This process was undertaken by juxtaposing the data to determine the consistency of findings (Struebert & Carpenter, 2011).

Confirmability is the process of leaving an audit trail. In order for the evidence and thought processes to be open to scrutiny, the researcher systematically recorded and managed all data (Patton, 2015; Struebert & Carpenter, 2011). This process was especially important in addressing any potential bias of the researcher during the qualitative phase.

Transferability refers to the possibility that the findings of the study have relevance to others. Nurses across many practice settings may find the study has relevance (Struebert & Carpenter, 2011). This concept will be addressed in the recommendations and limitations of the study in the following chapter.