

## Web-enhanced and on-line learning: A comparison of first year undergraduate nursing students' learning

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### Abstract

The current shortage of nurses has resulted in education providers looking to more flexible modes for delivering undergraduate nursing programs as a means of increasing student recruitment and retention. Ensuring these new modes of delivery meet learner needs and curricular outcomes, and are at least equivalent to traditional course delivery methods, is a challenge for nurse educators. This exploratory study compared students' (n=41) attitudes, learning experiences and cognitive knowledge acquisition in two different modes of delivery. First year nursing students enrolled in a practice-based nursing course delivered by either traditional 'internal' face-to-face mode with Web-enhancements or a 'flexible' on-line mode participated in the study. Students also attended on-campus practical learning sessions either on a weekly basis (internal mode) or as a single residential school (flexible mode). Findings revealed that while both groups supported their chosen learning mode, participants studying by 'flexible' mode were significantly ( $p < .05$ ) more supportive of this mode as it was perceived to be more compatible with their work/lifestyle balance. Students choosing to study by 'internal' mode were less comfortable using computers for studying or accessing and using the on-line resources. This group preferred to study by 'internal' mode as they believed the regular face-to-face component was consistent with their learning style. Feelings of learning isolation expressed by the 'flexible' group were reduced with the attendance at a face-to-face residential school. There was no difference in the cognitive learning scores between the two groups. In conclusion, these findings suggest that offering a practice-based nursing course, on-line in the first year of an undergraduate program is a comparable to a traditional, face-to-face Web-enhanced course. The choice of learning mode is subject to individual preference in learning style and work/life style balance. This choice is essential to attract student enrolments and ultimately reverse the recruitment shortage in nursing.

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## **Introduction**

Internationally, the nursing profession is committed to increasing the accessibility of education for a wider range of learners through the provision of more flexible modes of delivery (World Health Organization, 2000). These flexible modes allow students to learn at a pace and time that is compatible with their needs (Drozd & O'Donoghue, 2007). The definition of flexible learning in the literature varies, but generally it includes reference to student choice for the mode of study and variety of means for accessing staff and course content (Honey, 2004). Flexible modes may involve the use of technology-based, Web-enhanced content, face-to-face and full on-line delivery (Drozd & O'Donoghue).

Much has been written about the impact and effectiveness of flexible modes in education, psychology and to lesser extent postgraduate nursing programs (Adams & Timmins, 2006; Beta-Jones & Avery, 2004; Cybinski & Selvanathan, 2005; Honey, 2004). Studies comparing traditional face-to-face and Web-enhanced programs in postgraduate nursing programs show little difference in student learning outcomes (Atack & Rankin, 2002; Beta-Jones & Avery). Atack and Rankin, when describing registered nurses' (n=57) experiences with a Web-based postgraduate program, noted while participants liked the convenience of learning at home they were dissatisfied with the sense of isolation from peers and teachers. A subsequent qualitative study by Atack (2003) identified the following emerging themes: Knowledge, skills and comfort level with technology and the associated frustration; communication with the lecturer; amount and quality of on-line and face-to-face dialogue with peers and the lecturer (Atack). Atack proposed that collectively these themes contributed to a 15 per cent dropout rate from the program. Clearly identifying learner experiences is critical in retaining students in the program and fostering learning.

### ***Flexible learning in undergraduate studies***

Currently, little is known about the impact of flexible modes of delivery on student learning and retention in first year, undergraduate nursing programs. Teaching into the first year of a program can be challenging and differs from a postgraduate program. Both the lecturer and the learner may find the initial few weeks demanding as learners present with varying levels of computer literacy and reliable computer access. During these initial contacts, the lecturer prepares for the technical support needs of the student and the student learns to use the technology (Bennett & Glover, 2008; Buckley, 2003; Leisure, Davis, & Thievon, 2000; Mitchell, Assumpta, Carson, & McCann, 2007). Students who have little or no computer literacy skills or reliable computer access are immediately disadvantaged with their learning (Leisure et al.). Within nursing, students' Internet experience has been problematic (Bennett & Glover; Bond, 2004; Drozd & O'Donoghue, 2007; Whitehead, Brown, & Kearns, 2007). Indeed undergraduate students who have access to computers both at home and on-campus are twice as likely to receive higher grades when compared with those students who only had access to a computer at the university (Farrell, Cubit, Bobowski, & Samlon, 2007). Further, there is an assumption that the younger commencing students will have previous experience with information technology (IT) and computer literacy. However, Bond found the contrary; there was no association between the age of nursing students and prior Internet experience.

As with the registered nurse experiences of Web-enhanced learning, undergraduate users voiced an appreciation of the convenience and flexibility of the mode when compared with traditional face-to-face learning (Bennett & Glover, 2008; Farrell et al., 2007; Mitchell et al., 2007). Mitchell et al. conducted a mixed method study to explore undergraduate nursing views of Web-enhanced learning and found that while students were positive about the mode of learning they did experience difficulties. The number of times the student accessed the Web site was positively correlated with high grades in the course. In an Australian study of 213 undergraduate nursing students' experiences with Web-based learning, Farrell et al., found comparable outcomes in student grades and student satisfaction.

Issues of inadequate communication between peers and/or lecturer and not feeling part of a learning community have been expressed in undergraduate Web-enhanced courses. Adams and Timmins (2006), when describing first year nurses' (n=44) experiences of Web-based program, found that overall the experience was positive for the learner. While expressions of peer isolation were not reported, some students did choose to isolate themselves from other learners. This isolation between learners may have adverse consequences as learning is enhanced when student-to-student discourse occurs (Drozd & O'Donoghue, 2007). Where asynchronous on-line written communication has its limitations it is also acknowledged as a positive attribute of on-line learning as the medium allows each student to equally 'have a voice' in on-line group discussions (Swan, 2001).

### ***Learning the psychomotor skills of nursing***

Currently there is little evidence regarding the optimal method for teaching psychomotor nursing skills (Salyers, 2007). Evidence comparing Web-enhanced and traditional face-to-face modes of delivery reports little or no difference in either cognitive or psychomotor ability (Salyers). Salyers randomly assigned undergraduate nursing students to either a control (n=14) or intervention (n=22) group. The control group receives traditional face-to-face lectures with psychomotor demonstration over a three hour period, whereas the intervention group receives three hour psychomotor demonstration and completes course content by Web-enhanced lecture at their leisure. The Web-enhanced group scored significantly higher ( $p < 0.01$ ) on the final examination and while they generally performed better on the psychomotor skills examination this difference was not statistically significant. Limitations of this research were that the study was conducted at one site with a small convenient sample and technology experience and on-line learning were unaccounted for. As this is a relatively new area of nursing research, there is a dearth of empirical data (Mitchell et al., 2007). Several authors concur that further research is required to ascertain the quality of learning and to further highlight difficulties that emerge for this particular group predominantly within the Australian context (Adams & Timmins, 2006; Farrell et al., 2007). This study sought to address the imbalance. Where the focus of this study is undergraduate, pre-registration nursing, it is anticipated the findings will be also relevant in the post registration context as lifelong learning is now a component essential in the maintenance of professional competence (Gopee, 2000).

### ***Aim***

The aim of this exploratory study was to compare the influence of the two modes of delivering of a practiced-based course on the learning experiences and cognitive knowledge acquisition of first year undergraduate nursing students. Specifically, the research wanted to determine if there was a difference in learning experiences

or cognitive knowledge acquisition between the two groups. The research questions for this research are:

Do nursing students' in the flexible learning group and the internal learning group:

- have a preferred mode of learning?
- have different attitudes towards computer use?
- have different attitudes towards learning psychomotor?
- perform better on cognitive knowledge?

## **Method**

### ***Study participants***

The study was conducted within a regional university with four campuses, with the campuses being some 900 kilometres apart. Employing a non-probability, convenience sample, all beginning nursing students enrolled in a first year, practice-based course within the Bachelor of Nursing (BN) program were invited to participate in the study. Forty-three students from across the four campuses chose to participate in the study. Of these, twenty-four were enrolled in the flexible mode and 19 by internal mode. This represented 20.3% of the total class or 12.6% of 'internal students' and 40% of the students studying by flexible mode respectively.

The terms 'flexible' and 'internal mode' within the context of this study are outlined below. 'Internal mode' is a Web-enhanced mode of delivery where students attend weekly lectures that are delivered by interactive video conferencing delivered simultaneously to three different campuses. The students studying by internal mode also attend weekly, on-campus practical learning laboratories. The 'flexible mode' in contrast is an on-line course where student receive a one hour weekly lecture on-line via Blackboard and iBranz. In addition, 'flexible mode' students attend residential school consisting of a three-day practical laboratory session. Both modes of learning were supported by the use of Blackboard, video streaming, iBranz, on-line PowerPoint lectures and e-discussion.

A self-administered questionnaire, information letter, and reply-paid envelope for return of questionnaires were mailed to students following the set examination period. This time frame (after examination period) was chosen to specifically reduce the risk that students may feel pressured or coerced into participating for fear of failure. Participation was voluntary. Ethical clearance to conduct the research was received from the University Human Research Ethics Committee (HREC).

### ***Measures***

This descriptive research used a self-report survey with mixed methods of data collection. The items developed for data collection consisted of a mix of closed and open-ended questions offering participants the opportunity to express their opinion on specific topics. The final questionnaire consisted of 40 items consisting of five demographic questions, 31 closed-ended questions and four open-ended items. The

closed-ended questions were designed to elicit individual attitudes and preferences concerning their chosen mode of learning mode.

Four attitudinal items used were used to elicit participants' attitudes towards computer use, learning on-line, learning psychomotor skills and preference for the chosen mode of delivery. Each of these items consisted of a number of sub-items (Table 1). To ensure content validity the attitudinal items were adapted from questionnaires used in prior studies (Mitchell et al., 2007; Tung & Chang, 2008; Wilkinson, Forbes, Bloomfield, & Gee, 2004).

**Table: 1 Attitudinal questions**

<b>Sub-Item (Code)</b>	<b>Number of questions</b>
<b>Preferred mode of learning</b>	
learning mode was what they expected	1
enjoyed the respective modes of learning	1
prefer more face-to-face learning	1
choice of learning mode should be offered for students next year	1
<b>Computer use</b>	
computer use	5
computer anxiety	4
compatibility	3
<b>Learning on-line</b>	
perceived ease of use	4
perceived financial cost	2
peer support	3
<b>Learning psychomotor skills</b>	
practical on-campus learning	3
practical on-campus learning time	3

To identify participant preference for their chosen mode of learning, participants were asked to identify their level of agreement in response to four statements. The item titled 'computer use' contained five questions and elicited information about computer use and anxieties when using computers (Chua, Chen, & Wong, 1999; Tung & Chang, 2008). The ease of using a computer, financial costs, perceptions of peer support and being part of a learning community contributed to attitudes towards on-line learning (Tung & Chang). Participant attitudes towards learning psychomotor skills were explored through six questions related to the time commitment of face-to-face learning. The average of the sub-items for each of the attitudinal items constituted the participant attitude score. Participants' final score for the course was used to compare cognitive knowledge for the two groups.

The dependent variables were scores on the attitudinal questions and the participants' final score for the course. All attitude measures utilised a five-point Likert type-scale anchored by strongly agree = 1 and strongly disagree = 5. Some items were reverse scored. Prior to use, the questionnaire was pilot tested with first year nursing students not enrolled in the course. Feedback resulted in minor contextual and grammatical changes.

## **Data analysis**

Quantitative data were analysed using the SPSS for Windows version 15. Frequencies, means and standard deviations were computed to obtain a profile of the participants' demographic characteristics. Nominal data (dichotomous variables) were analysed using Chi-Square. Comparisons between the two groups were compared using independent t-test and a one-way between groups multivariate analysis of variance MANOVA for continuous variables. A statistical significance level of  $p < .05$  was set.

Qualitative open-ended responses were transcribed verbatim and analysed using constant comparison method. Members of the research team independently read through the responses several times to identify key words, quotations and phrases to enable coding. Common codes were then grouped under broad themes. The research team then collectively compared the themes developed independently and discussed differences until consensus and saturation was reached. The final stage of analysis was for the research team to discuss the concordance or divergence between the quantitative and qualitative findings in relation to the research question.

## **Results**

The majority of participants were female (97.6%,  $n=42$ ) with one male. The average age group of the total cohort was 30.2 years (SD 10.16); 42 percent were less than 25 years of age with a range of 17 to 51 years. While the participants' in the 'flexible' group were slightly older 31.3 years (SD 9.18) than the internal students (28.8 years, SD 11.39), this difference was not significant ( $t = -.786$ ;  $df 41$ ;  $p = .447$ ).

### ***Preference for chosen mode of learning***

An independent t test was used to compare the preferences of the two groups. Both groups strongly agreed that they enjoyed the respective modes of learning ( $t(41) = -0.901$ ,  $p > .05$ ) and that the learning mode was what they expected ( $t(41) = -0.232$ ,  $p > .05$ ). Participants studying by 'internal mode' had significantly stronger beliefs that they would prefer more face-to-face learning ( $M = 1.42$ ,  $SD 0.606$ ) than the 'flexible' group ( $M = 3.17$ ,  $SD 0.963$ ),  $t(41) = -6.88$ ,  $p < .001$ ). Also participants studying by flexible mode had significantly stronger convictions that the choice of learning mode should be offered for students next year ( $M = 1.13$ ,  $SD .448$ ) than did the 'internal group' ( $M = 2.26$ ,  $SD 1.28$ ),  $t(41) = 4.05$ ,  $p < .001$ .

Specific attitude items were entered as the dependent variables with the independent variable being the mode of study. To determine the attitude scores, items were scored and averaged for each participant. Thus, participants with lower mean scores indicate more positive attitudes. The Shapiro-Wilk test of univariate normality was statistically significant on several variables. However, this was not considered problematic as the MANOVA is considered robust with respect to univariate non-normality when group sizes exceed 30 (Allen & Bennett, 2008). The Box's M was non-significant indicating that homogeneity of variance-covariance matrices could be assumed.

The results indicate statistically significant differences in the attitude variables between participants studying by internal and flexible modes, Pillai's multivariate

$F(8, 34) = 5.195$  ( $p < 0.001$ ). The participants who were studying by flexible mode reported significantly more positive (i.e., lower) attitudes towards on-line learning ( $M = 1.67$ ) than did those who were studying by internal mode ( $M = 3.416$ ). Follow up univariate tests of significance showed no effects for computer use, computer anxiety, perceived financial costs, practical on-campus learning or practical on-campus leaning time. Significant findings were found for compatibility ( $p = .0001$ ), perceived ease of use ( $p = .015$ ) and perceived peer support ( $p = .039$ ); however, only compatibility remained statistically significant at a Bonferroni adjusted alpha level of .006,  $F(1, 41) = 35.73$ ,  $p = .001$ , partial  $\eta^2 = .466$ . Participants studying by flexible mode were more likely to believe that the on-line learning mode was compatible with their learning.

## **Computer Use**

Participants studying by flexible mode were more likely to strongly agree that they enjoy using the computer for study ( $t(41) = .252$ ,  $p = .016$ ). While there was no statistically significant difference, the majority of both internal and flexible participants agreed or strongly agreed that they use a computer in their daily life, have access to a computer whenever they want, are able to communicate with other people with e-mail and enjoy using a computer for leisure.

Participants studying by flexibly mode were more likely to express less anxiety about making mistakes they cannot correct or using Blackboard. Internal students were significantly more likely to express concerns about destroying large amounts of data on Blackboard by hitting the wrong key ( $t(41) = -2.10$ ,  $p = .042$ ). Participants studying by flexible mode strongly agreed that on-line learning was compatible with their learning ( $p = 0.001$ ), appropriate for their life style ( $p = 0.001$ ) and learning ( $p = 0.001$ ). These attitudes were significantly stronger when compared with the internal participants who were more likely to express no strong views. Both internal and flexible participants were similarly positive about the perceived ease of using the Blackboard site. Again 'flexible' participants expressed more positive perceptions about the ease of getting Blackboard to do what they requested ( $p < 0.05$ ), ease of use ( $t = 2.12$ ,  $p = .040$ ) and clarity of the human interface of Blackboard ( $t = 3.29$ ,  $p = .002$ ). The financial cost of on-line learning was of concern for both internal and flexible participants equally. There were no significant differences between the groups. Positive perceptions of support from other students with learning and feeling part of a learning community were expressed by both participants studying by internal and external mode. Participants studying by flexible mode were significantly more likely to express feelings of isolation with their learning ( $t = 2.92$ ,  $p = .006$ ).

## **Learning psychomotor skills**

All participants equally agreed or strongly agreed that on-campus practical learning laboratory was compatible with their learning style ( $p > .05$ ) and prepared them the off-campus practicum ( $p > .05$ ). While not significant, the participants studying by 'flexible' mode were again more likely to agree that the on-campus practical laboratory was appropriate for their lifestyle and prepared them for the off-campus experience. Adequate time was available during the on-campus learning laboratories to interact with both the lecturer and other students. There were no significant differences in perception of time between the groups ( $p > .05$ ). Participants studying by internal mode were more likely to want more time to practice clinical skills during the on-campus practical laboratory sessions ( $p > .05$ ).

## Cognitive scores

There was no difference in the mean score on the final examination between the internal (77.8, SD 10.57) and the flexible mode (81.4, SD 7.72) participants. The t test was non-significant,  $t(29.19) = 1.16$ ,  $p = .253$ , two-tailed.

## Qualitative responses

Qualitative responses from the participants, in response to the open-ended questions, extended our exploration of students' personal experiences of learning by the difference modes. Recurring themes in the data related to learning style and lifestyle balance. Participants studying by internal mode were inclined to choose this mode because of their personal learning style, whereas the flexible mode students were more inclined to discuss lifestyle or family/study/work balance.

## Learning style

Participants choosing to study by internal mode identified that contact with both the lecturer and their peers were important influences on learning. Regular face-to-face contact and interaction with the lecturer allowed the learner to have their questions answered in a timely manner facilitating learning, as two students noted:

*The physical experience of sitting in a lecture helps me to remember ...  
Immediate answers to questions and clarification is more supportive.  
Prefer peers to help motivate me*

Similarly, this group (internal mode) believed questions were less likely to be left unanswered in the face-to-face session as they felt more confident to ask questions within smaller familiar groups. Participants studying by both modes noted the use of technology inhibited their interaction with other students and confidence to ask questions.

*... some times it is hard to put down in an email what you need to ask  
(flexible mode)*

*I am more likely to ask questions in a practical session face to face with a  
person than use a microphone in a lecture.( internal mode)*

Contact for the 'flexible' learning group was commonly expressed in combination with feelings of isolation. Participants studying by 'flexible' mode when watching the recorded on-line lectures noted the interactions between the lecturer and students in the class, expressed feelings of 'being left out'.

*At times flex students feel very isolated. There are some lecturers who forget  
to include us [flexible] when talking in the video stream lectures ...*

and

*When watching a lecture, flex students feel a bit behind.*

These feelings of 'isolation' disappeared when they had face-to-face contact with the lecturer and other students during the block on-campus practical learning.

*I do really enjoy the residential schools and the concept of 'block' learning. This is the point where the isolation disappears and you meet others who live a long distance away but you bond during these sessions.*

*I love Res school, I come away feeling great because I learn so much more and I don't feel so alone/isolated.*

As with the 'internal' group participants studying by flexible mode noted the residential block learning period was also a time where they could clarify issues with the lecturer face-to-face and learn from peers.

*Seeing first hand the skills we need to learn and help is at hand if needed.*

*Include time in the labs [residential schools] to discuss assignments*

Structure afforded by both of the modes was mostly identified by both groups as a positive concept. The 'internal' group noted that the structure of the weekly lectures maintained their motivation to attend lectures and study. Studying in this manner was perceived to be easier as there were fewer distractions.

*I wanted face to face contact and would not be as applied to my studies if I did not have a structure in place*

and

*The face to face contact helps me to stay up to date with my studies*

Conversely, participants in the 'flexible' group noted that the flexible structure allowed them to study at their own pace and time. As many of the participants in this group were maintaining paid employment or meeting family needs, times they were available to commit to study were dictated by these personal commitments.

*Flex gives me the time to choose when I fit my study and lectures in during my busy week*

This group did note that they were very cognisant of the need to be organised and motivated with their learning at home.

*Have to be very self motivated, which can be hard sometimes*

## Lifestyle Balance

The second main theme was lifestyle balance. Balancing family and financial commitments and distance were the main themes that influenced the decision to choose flexible mode. Studying by flexible mode allowed carers of young children to be present when the family need them

*I am a single mum of 3 children who need me at home most of the time...*

*Work in and around family and work. Unable to commit to travel to university*

Attending residential school only once a term meant participants were able to continue to meet their financial commitments.

*I could not have undertaken this degree unless I could do it externally. I do not have the option of not working and studying on campus*

Attending the on-campus residential session was viewed as both a positive and negative experience. Negative comments about leaving the family, absence from paid employment, the cost of travel and accommodation were expressed.

*I find residential school demanding on my life with finding child care and getting time off work*

*Having to organise child care is expensive (and there is no one where I live now!)*

As meeting these commitments were a priority, participants expressed concern when they perceived that ‘time was wasted’ during the residential schools.

*students and lecturers get distracted and off track – waste a lot of time telling irrelevant stories*

and

*...ensure that people who come for res [sic] school behave appropriately and ask anyone who are being distracting to leave!*

These negative expressions were articulated within the context of the overall benefit of the study mode.

*Obviously spending time away from the family is difficult; however this is what allows us to study this degree. It really is a small sacrifice with the benefits far outweighing the disadvantages.*

## Discussion

Conflicting evidence has been reported in the literature about nursing students’ satisfaction with on-line and Web-enhanced learning (Kearns, Shoaf, & Summey, 2004; Mitchell et al., 2007). This is one of the first studies conducted that compares undergraduate nursing students’ attitudes and preference for learning by either ‘internal’ (Web-enhanced) or ‘flexible’ (on-line course) modes in a first year practical-based nursing course. Participants studying by ‘flexible’ mode reported significantly more positive attitudes towards learning than those who were studying by ‘internal’ mode. Consistent with previous studies this study found that there was no significant difference in student learning outcomes when studying by either ‘internal’ or ‘flexible’ mode (Atack & Rankin, 2002; Beta-Jones & Avery, 2004).

Students studying by ‘flexible’ mode were significantly more likely to identify that the chosen mode was more compatible with their life and learning style. Distance and family commitments were the main influences in this choice of learning mode. This is consistent with previous research students studying by ‘flexible’ learning commenting that this mode saved them time and money by not having to commute to and from the university on a regular basis (Bennett & Glover, 2008; Farrell et al., 2007; Mitchell et al., 2007; Tung & Chang, 2008) and should be offered again (Mitchell et al.). These assertions continued to hold true, even though the on-line learning group still had to travel attend an on-campus residential learning practical session. Because of the financial and personal cost of travelling to attend residential schools participants proposed that the delivery of the content in these sessions must be presented to optimise learning within the limited time available.

Issues of inadequate communication between peers and or the lecturer, not feeling part of a learning community and isolation, which have been highlighted in previous studies (Farrell et al., 2007; Kearns et al., 2004), were mirrored in this study. This observation reinforces the importance of the on-line learning community and the development of friendship groups. Such groups encourage peer support and increase confidence to ask questions in the on-line community. Having noted this, these feelings were greatly reduced with the attendance at the compulsory residential schools. Allocating dedicated time and activities during the residential schools to facilitate formation of friendship groups and shared learning communities is prudent.

Numerous studies have highlighted nursing student anxiety using and accessing computers in the initial stages of Web-enhanced and on-line courses (Mitchell et al., 2007; Scott, Gilmer, & Fielden, 2008). Where there was no difference in computer use or computer anxieties between the two groups, participants studying by 'flexible' mode enjoyed using the computer for study and were less likely to express concerns about using the technology. This difference may be attributed to the fact that the participants studying by 'internal' mode expressed that the main reason for choosing this mode was because of the face-to-face component of the mode. Indeed this group were both statistically significantly more likely to prefer more face-to-face teaching as this contact was more consistent with their learning style. This is an important point to consider when delivering courses that are advertised as 'internal' mode, which do in principle have a large component of Web-enhanced learning.

Compatibility as described by Tung and Chang (2008) is the degree to which the innovation is perceived to be consistent with existing values and needs. Learners studying by 'flexible' mode found this mode of study more compatible when compared with the 'internal group'. Compatibility has been shown to have a direct effect on perceived usefulness and technology acceptance. Findings that the participants studying by 'flexible' mode were more accepting of the technology and were more self-motivated in their learning builds on the findings of others (Atack, 2003; McVeigh, 2009; Mitchell et al., 2007). Internet assisted strategies and not having immediate face-to-face feedback potentially facilitated acceptance of the technology and greater independent learning in the on-line learning group.

## **Limitations**

There are several limitations to this study that need to be considered in the interpretation of the results. This is a small-scale study where the sample was drawn from a single course within a single university. The study was conducted at one university examining a single, first year course. Hence the findings cannot be generalised equally to other first year Web-enhanced or on-line courses as different courses will have different learning objectives, content and quality of on-line resources. Despite these limitations the authors believe that the study contributes meaningfully to the comparison of Web-enhanced and on-line learning in practice-based, undergraduate nursing programs.

## **Conclusion**

Web-based courses in nursing have proliferated in recent years as the profession attempts to address the learning styles of individual learners and recruit learners to undertake nursing studies (Farrell et al., 2007; Mitchell et al., 2007). This study has shown that a practice based, nursing course offered on-line in the first year of the

program affords a work/life balance and has the same cognitive learning outcomes when compared to a Web-enhanced mode of learning. Although there was strong support for learning on-line it was evident that this was not a universal panacea. The choice of learning mode, Web-enhanced or on-line is clearly subject to individual preference in learning style and work/life style balance. Where possible both modes of learning should continue to be offered.

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