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"Wherever, whenever" learning in Medicine: Evaluation of an interactive mobile case-based project

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The increased availability of smartphones[1] with Internet capabilities has led many educators to consider their potential for delivering mobile learning materials to students. In 2009 and 2010 three case-based scenarios were developed for mobile devices by staff at the University of Sydney and The Children's Hospital at Westmead. A trial of the pilot scenario was held with fourteen medical students in late 2009. The students were positive and made recommendations for improving the case scenarios. Their suggested changes were incorporated into phase two scenarios in 2010. Throughout 2011 evaluations were conducted with a total of 171 students and quantitative analysis of the data was performed. Results indicated that whilst students liked the mobile cases, they did not utilise them as mobile resources as anticipated. Some differences were also revealed between the digital immigrants' and digital natives' interactions with the case scenarios, as well as some variations between male and female students.

Keywords: mobile learning, case-based elearning scenarios

Introduction

The first decades of the 21st century herald interesting times for both educators and students. Learning and teaching in tertiary education is shifting from structured learning environments such as lectures and tutorials into a new mode of 24/7 access to learning anytime and anywhere, limited only by the flexibility of resources made available to students by their institution.

Case-based learning is a well-established methodology in medical education (Mostaghimi et al. 2006). It can help students develop critical reasoning skills, the ability to acquire and evaluate information, the capacity to generalise and transfer knowledge, and become lifelong learners (Mostaghimi et al. 2006; Ludmerer 2004). Ultimately, case-based learning enables students to translate what they have learned from the basic sciences to real-life clinical situations (Reese 1996). Information technology can enhance learning by enabling students to rapidly incorporate information into clinical practice (Mostaghimi et al. 2006) and can improve learning through case-based scenarios (Reese 1996).

At Sydney Medical School, case-based learning in the form of Problem-Based Learning (PBL) has been a feature of the teaching curriculum since 1997. Following a review of Sydney Medical Program, in 2009 the

[1] Smartphone: a high-end mobile phone that combines the functions of a personal digital assistant (PDA) and a mobile phone. Source: http://en.wikipedia.org/wiki/Smartphone

number of PBL cases was reduced to make way for additional teaching in foundation anatomy and physiology. Three of the discontinued PBL cases formed an important part of the curriculum of the Discipline of Paediatrics and Child Health and academic staff wanted to continue to provide learning resources based on these cases for students.

In 2005 – 2006, case-based learning was developed for the iPod for medical students at the University of Adelaide by Palmer and Devitt (Palmer & Devitt, 2007). By 2009 global developments in mobile phone and mp3 player technology were hard to ignore. The iPod Touch, the first iPod with wireless connectivity, had been available globally since September 5, 2007[2] and smartphone use in general was increasingly visible among the medical student cohort in tutorials. There was now a generation of students that 'have spent their entire lives surrounded by and using computers, videogames, DVD players, videocams, eBay, cell phones, iPods, and all the other toys and tools of the digital age' (Prensky, 2001, p. 1). With the Palmer and Devitt model in mind and an enthusiastic student cohort, the academics within the Discipline of Paediatrics and Child Health decided to explore the potential benefits of mobile learning for the discontinued course material.

Support was provided by Apple, Sydney eLearning (the University of Sydney's central elearning support unit) and the Manager of Web Development at Sydney Medical School to develop the paediatric case-based learning scenarios as mobile cases. The project goal was to provide these learning materials as a mobile resource to enable students undertaking the Child and Adolescent Health specialty block (CAH) to review and reinforce their learning under the Basic and Clinical Sciences and Patient-Doctor themes, as well as their clinical reasoning skills, when they were away from a desktop computer and the structured learning environment.

This paper reports on research conducted with students who undertook CAH at The Children's Hospital at Westmead Clinical School in 2011. We aimed to discover students' attitudes towards usability, content and access, as well as the perceived benefits.

The Project

The mobile case-based learning scenarios were developed for medical students who each year undertake CAH as part of the Sydney Medical Program. The initial mobile case developed in 2009 mirrored medical students' PBL tutorials. It contained the presentation of an adolescent patient with Anorexia Nervosa, constructed from a slide show with accompanying audio file, and an unfolding case description. It also contained interactive true/false and checkbox-style questions with automatic feedback, designed to engage the students in the associated reading material, lectures, references and web links. The case was developed using HTML, with Hot Potatoes freeware for the questions.

In October-November 2009, a trial of the pilot mobile case was held with 14 medical students with approval from the University of Sydney Human Research Ethics Committee. Students were provided with an iPod Touch, loaned by Apple, with the case pre-loaded. Students were given an orientation to the mobile case and the iPod Touch. The eight students who participated in a follow-up evaluative survey and focus group favoured the mobility of the elearning device. The students were positive about the potential use of the iPod Touch for learning and made useful recommendations for improving the mobile case and developing elearning materials on mobile devices. Students reported that they liked, "just having it all at your fingertips - portable," and the "freedom to do [self-directed study] whenever and wherever."

The project team was keen to address student feedback when developing the phase two mobile cases in 2010. Consequently, student requests for a more structured narrative flow and integrated questions, along with an improved graphical user interface, were incorporated into the second and third mobile cases on Rubella and Phenylketonuria. A 'resume' function, which allowed them to 'bookmark' their place in the case, cumulative scoring of questions and a cleaner interface were included in the new design. The content was written to mirror an authentic clinical reasoning process, as if students were participating in a Clinical Reasoning Session tutorial (CRS tutorial), mirroring real life clinical practice with patients. Questions were all single best answer multiple-choice. A pre-case quiz was developed to engage students in the topic and more references to online publications were incorporated. The case was developed using CSS3 and HTML5. They utilised the HTML5 capabilities of the Safari mobile browser to allow students to 'store' the web pages in their device for later use, or in an offline situation, such as at the patient bedside or whilst on public transport. The multiple-choice questions were built in JavaScript and scores and repeated attempts were recorded. The pilot mobile case on

[2] http://en.wikipedia.org/wiki/IPod_Touch

Anorexia Nervosa was redeveloped in the new style. The download of the mobile case was significantly improved to facilitate access by students with their own devices.

Methodology

In 2011 research was conducted with 175 students who undertook CAH over three of the four eight week terms that were held that year. Students were briefed on how to use the mobile cases during their orientation to CAH. Students worked through the mobile cases during the term on a loaned iPod Touch, their own mobile device or a desktop computer in the hospital or their own homes.

In order to evaluate the mobile case-based learning scenarios, a survey was developed and approved by the University of Sydney Human Research Ethics Committee. It comprised both quantitative Likert-type questions and qualitative items. On completion of CAH, students were asked to complete the paper survey (see Appendix 1).

Ten survey questions were analysed for this paper. They used a five-point Likert-style rating with standard 1= 'strongly disagree' to 5 = 'strongly agree' (see Table 1). The questions were grouped into four themes for further analysis: usability, content, access and perceived benefits for students.

Table 1: Balanced five point Likert scale with middle category as neutral

Scale	1=	2=	3=	4=	5=
	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree

Methods of analysis using mean and standard deviation based on parametric testing procedures are often used for analysis of Likert scale data. However, non-parametric procedures based on the rank, median or mode are appropriate along with distribution free methods (Allen, 2007), and these were used.

Results

Of the 175 students who undertook CAH, 171 students participated in the survey, providing a 98% response rate. We present an overall analysis of the responses, then more detailed analysis based on reported student gender and age, and the type of web-enabled device used by students.

Scale items 1 and 2 ('strongly disagree' and 'disagree') and 4 and 5 ('agree' and 'strongly agree') were combined for analysis. A summary of responses to survey questions 1 – 10 is presented in Table 2. The median and mode for each question is presented as a measure of central tendency.

Survey respondents did not complete all questions. While 136 of the 175 students answered question 1, there was a greater response for other questions, such as question 3 – question 9, with 142 student responses. Regarding demographic details, 171 students gave their age and 169 their gender.

Shapiro-Wilk test results (between 0.762 to 0.876) suggest the data is not based on a normal distribution for each of the samples grouped by usability, content, access and perceived benefits to students (with p-values < 0.05). Also, approximately 74% of the group are 28 years of age or less, meaning the size of the sample for the digital immigrants is smaller than that for the digital natives. The sample size for the digital immigrants is less than 10 for questions 2 and 3, in which significant differences were found between the two groups. However, sample size issues do not arise for other tests based on digital natives or those tests based on gender and type of mobile device.

The Mann-Whitney U test was used as a non-parametric measure of central tendency. It is suitable for comparing small groups, with ordinal variables and when the distribution is asymmetrical (Nachar, 2008).

Table 2: Measures of central tendency and percentage agree for sample

	N (Valid)	Median	Mode	Percentage strongly agree or agree	Neither agree nor disagree	Percentage disagree or strongly disagree	N=
Q1 - The case-based scenarios for mobile devices were easy to use.	136	4.00	4	57.4%	32.4%	10.3%	136
Q2 - I found the structure of the CRS tutorials easy to follow.	141	4.00	4	83.0%	14.9%	2.1%	141
Q3 - I had no technical difficulties working through the cases.	142	4.00	4	69.7%	9.2%	21.1%	142
Q4 - I answered all the questions in the cases and read the explanations.	142	4.00	4	66.9%	16.2%	16.9%	142
Q5 - I read through all the learning topics.	142	4.00	4	56.3%	13.4%	30.3%	142
Q6 - I viewed all the lectures.	142	4.00	4	53.5%	6.3%	40.1%	142
Q7 - I worked through the cases during free time while on clinical attachments.	142	4.00	4	57.0%	10.6%	32.4%	142
Q8 - I worked through the cases while travelling to and from clinical attachments.	142	2.00	2	33.8%	11.3%	54.9%	142
Q9 - I revised my knowledge by working through the cases.	142	4.00	4	73.2%	12.7%	14.1%	142
Q10 - I learnt new information from the cases.	140	4.00	4	82.1%	9.3%	8.6%	140

The ten questions were grouped into four areas for overall analysis:

1. Usability (questions 1 – 3)
2. Content (questions 4 – 6)
3. Access (questions 7 – 8)
4. Perceived benefits for students (questions 9 – 10)

With regard to usability, the students' responses were mixed, with 57.4% strongly agreeing or agreeing with question 1 that the mobile cases were easy to use, 83% strongly agreeing or agreeing with question 2 that the tutorials were easy to follow and 69.7% strongly agreeing or agreeing with question 3 that they had no technical difficulties working through the mobile cases. On the questions related to content (questions 4 – 6), students were more positive about the quizzes (66.9%) than the learning topics (56.3%) and lectures (53.5%).

In terms of accessing the materials, just one-third (33.8%) of students used the mobile cases while travelling and 57% of the students reported using the mobile cases in their free time (questions 7 – 8).

In the final two questions (9 – 10) on the perceived benefits, students were positive about the benefits of the mobile cases for knowledge revision, with 73.2% strongly agreeing or agreeing with this question. In terms of learning new information, the students rated the mobile cases highly, with 82.1% strongly agreeing or agreeing with this question.

Gender Difference

Of the participants, there were 89 males (52% of total students), and 80 females (46.8%). Two respondents did not identify their gender. Table 3 summarises the responses for each question by gender.

Table 3: Summary of results by gender

Q1 -5	Q1		Q2		Q3		Q4		Q5	
Gender	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Mode	4	4	4	4	4	4	4	4	4	4
Median	4	4	4	4	4	4	4	4	4	4
St Deviation	0.80	0.91	0.57	0.65	0.98	0.99	0.94	1.02	1.16	1.05
Agree or Strongly Agree (%)	58.0%	56.7%	77.0%	89.6%	66.7%	73.1%	68.0%	65.7%	53.3%	59.7%
Disagree or Strongly Disagree (%)	5.8%	14.9%	0.0%	4.5%	20.0%	22.4%	13.3%	20.9%	29.3%	31.3%
Neutral (%)	36.2%	28.4%	23.0%	6.0%	13.3%	4.5%	18.7%	13.4%	17.3%	9.0%
Q6 - 10	**Q6**		**Q7**		**Q8**		**Q9**		**Q10**	
Gender	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Mode	4	4	2	4	2	2	4	4	4	4
Median	4	4	3	4	2	2	4	4	4	4
St Deviation	1.35	1.44	1.21	1.16	1.20	1.23	0.84	0.93	0.83	0.81
Agree or Strongly Agree (%)	52.0%	55.2%	46.7%	68.7%	37.3%	29.9%	74.7%	71.6%	82.4%	81.8%
Disagree or Strongly Disagree (%)	38.7%	41.8%	40.0%	23.9%	50.7%	59.7%	12.0%	16.4%	9.5%	7.6%
Neutral (%)	9.3%	3.0%	13.3%	7.5%	12.0%	10.4%	13.3%	11.9%	8.1%	10.6%

Analysis using the Mann-Whitney U test is presented in Table 4.

Table 4: Mann-Whitney U test for gender

Test Statistics										
	Q1	**Q2**	**Q3**	**Q4**	**Q5**	**Q6**	**Q7**	**Q8**	**Q9**	**Q10**
Mann-Whitney U	2185.5	2092	2448	2372	2461.5	2419.5	2055	2167.5	2397	2309.5
Wilcoxon W	4463.5	4867	5298	4650	5311.5	5269.5	4905	4445.5	4675	4520.5
Z	-0.584	-1.954	-0.296	-0.62	-0.221	-0.393	-1.971	-1.475	-0.537	-0.638
Asymp. Sig. (2-tailed)	0.559	0.051	0.767	0.535	0.825	0.694	0.049	0.14	0.591	0.523
a Grouping Variable: gender (1=male 0=female)										

We observe a difference between the two groups for question 2 at the 10% level of significance, with a p-value = 0.051. Approximately 89% of females agreed that the structure of the CRS tutorials was easy to follow, compared to only 77% of males. Question 7 also demonstrated a significant difference, with a p-value = 0.049 at the 5% level of significance, where approximately 68% of females agreed that they worked through the mobile cases during free time while on clinical attachments, compared to only approximately 46% of males.

Age

The age range of the sample group was 21to 51 years and the mean age 27 years, with 90% of the sample aged 30 or below. Approximately 75% of the sample were aged 28 or below. The median age was 26 years, with a mode of 25 years. The age profile in the sample therefore follows a non-normal distribution, however, it is to be expected as Sydney Medical Program is graduate entry.

In order to test for a 'digital native' distinction, we separated the sample into two groups based on Prensky's classification of 'digital immigrant' and 'digital native', with 'digital immigrants' being those born before 1980 (aged 32 years and above) and 'digital natives' born after 1980 (aged 31 or below) (Helsper & Eynon, 2009). We then tested for differences between these groups for questions 1 – 10 and have reported p-values (Sig 2-

tailed). As the beginning of the digital native generation is not clearly defined, sometimes starting in 1980 and sometimes 1982 or 1983, the test is repeated for generations born 1980 to 1984 (age range 28 to 32).

Analysis using the Mann-Whitney test showed that for those aged 28 years or below, there is a statistically significant difference in relation to question 8, with p-value < 0.019 (see Table 5). At the 10% level of significance, there is also a difference for question 1. Digital immigrants scored the higher mean rank in the Mann-Whitney U test for those aged 29 years or higher in relation to questions 1 and 8. This suggests the digital immigrants were more likely to have found the mobile cases easy to use and were more likely to have worked through the mobile cases while travelling compared to the digital natives.

Table 5: Mann-Whitney Test: Digital natives vs. digital immigrants

0 =28 or below 1=29 or above		N	Mean Rank	Sum of Ranks
Q1 - The case-based scenarios for mobile devices were easy to use.	0	99	64.80	6415.50
	1	37	78.39	2900.50
	Total	136		
Q8 - I worked through the cases while travelling to and from clinical attachments.	0	104	66.83	6950.00
	1	38	84.29	3203.00
	Total	142		

Another significant difference was found for the group aged 32 and above (see Table 6). The ‘digital natives’ scored the higher mean rank and were more likely to find the structure of the CRS tutorials easy to follow and to have answered all the questions and read the explanations. These results are significant at the 5% level of significance, with p-values = 0.034 and 0.028 respectively for question 2 and question 4. For the group aged 30 years or below, a significant difference was also found on question 4. This was also significant at the 5% level of significance, with p-value < 0.047.

Table 6: Mann-Whitney Test: Digital natives vs. digital immigrants

0=31 or below 1=32 and above		N	Mean Rank	Sum of Ranks
Q2 - I found the structure of the CRS tutorials easy to follow.	0	131	72.65	9517.00
	1	10	49.40	494.00
	Total	141		
Q4 - I answered all the questions in the cases and read the explanations.	0	132	73.43	9693.00
	1	10	46.00	460.00
	Total	142		

The groups aged 32 years or below and 33 years and above were also statistically significant for questions 2 and 6 (see Table 7). Digital natives scored a higher mean rank for both questions. Both were statistically significant at the 5% level of significance, with a p-value < 0.010 for question 2 and p-value < 0.049 for question 6.

Table 7: Mann-Whitney Test: Digital natives vs. digital immigrants

0=32 or below 1=33 or above		N	Mean Rank	Sum of Ranks
Q2 - I found the structure of the CRS tutorials easy to follow.	0	134	72.66	9736.00
	1	7	39.29	275.00
	Total	141		
Q6- I viewed all the lectures.	0	135	70.01	9451.00
	1	7	100.29	702.00
	Total	142		

Based on these results, we observe again that digital natives were more likely to have found the structure of the CRS tutorials easy to follow. Based on question 6, digital immigrants were more likely to have viewed all the lectures. These results are at the lower limits for sample size when this partition is applied to results.

Type of web-enabled device

Results show that 87 students were accessing cases on an Apple device (iPhone, iPad, iPod Touch), while 30 students were using other brands. Usability experience is highlighted by question 1 (whether the scenarios for mobile devices were easy to use) and question 3 (any technical difficulties working through the cases). Figure 1 shows the types of mobile devices used by students for the case studies:

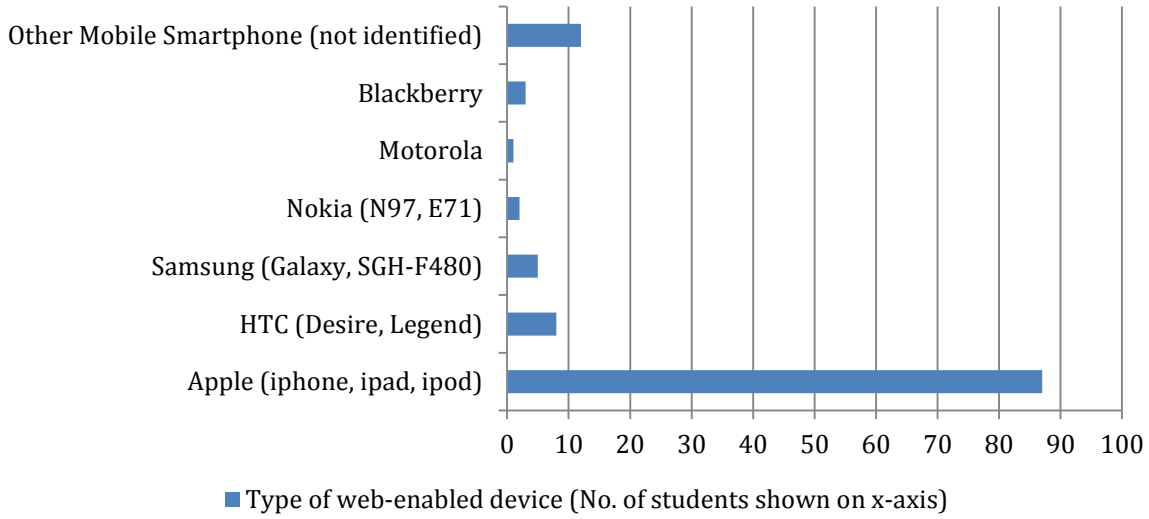

Figure 1: Type of web-enabled device

Attitudes on usability were mixed, with 57.4% strongly agreeing or agreeing with question 1 and 69.7% strongly agreeing or agreeing with question 3 (see Table 2). One reason for this may have been that the experience of the student was different based on the type of device they used. For example, students using Android/Google-based smartphones may have had difficulty as the mobile cases were designed to run using the Safari browser on an Apple device. To test for this, we examined whether the experience differed depending on whether the user had an Apple device or other handheld device or smartphone. The Mann-Whitney U test findings suggest there is no real difference between the experience of Apple and non-Apple users (see Table 8).

Table 8: Mann-Whitney U test based on type of device: Apple users versus other device

Dummy variable by type of device (where 0=Apple and 1=not Apple)	**Mann-Whitney U**	**Wilcoxon W**	**Z**	**Asymp. Sig. (2-tailed)**
Q1 - The case-based scenarios for mobile devices were easy to use.	816	3517	-0.538	0.591
Q2 - I found the structure of the CRS tutorials easy to follow.	793.5	3643.5	-1.735	0.083
Q3 - I had no technical difficulties working through the cases.	866.5	3792.5	-1.067	0.286
Q4 - I answered all the questions in the cases and read the explanations.	978.5	1329.5	-0.079	0.937
Q5 - I read through all the learning topics.	979	1330	-0.075	0.941
Q6- I viewed all the lectures.	772.5	1123.5	-1.717	0.086
Q7 - I worked through the cases during free time while on clinical attachments.	812.5	3738.5	-1.449	0.147
Q8 - I worked through the cases while travelling to and from clinical attachments.	884.5	1235.5	-0.832	0.406
Q9 - I revised my knowledge by working through the cases.	966.5	1317.5	-0.188	0.851
Q10 - I learnt new information from the cases.	944	1295	-0.281	0.779

a. Grouping Variable: type of device 2 (0=apple 1=other handheld)

The only significant differences between Apple and non-Apple users was for question 2 (in relation to the structure of the CRS tutorials) and question 6 (I viewed all the lectures). This was significant at the 10% level of significance. The result for question 6 may be explained by the delivery of lectures via iTunesU and the difficulty in accessing this on non-Apple devices. There is no difference between groups in relation to ease of use or technical difficulties. This is an unexpectedly positive outcome, given that the design and development of the cases was solely focused on the Apple iOS.

Discussion

The results revealed some interesting insights into where the mobile case-based learning scenarios were used, the students' preferred structure and the generational differences in approaching the mobile cases. These factors may assist educators in their design of similar learning materials in the future.

One of the goals of this project was to provide these mobile cases to students on mobile devices so that they could review and reinforce their learning while away from the structured learning environment. Despite this, just one-third of students used them while travelling. The geographical location of The Children's Hospital in Westmead (a suburb about 45 minutes by train from the Sydney CBD) may be a factor as students may drive rather than take public transport. It may not have been as practical for students to use the mobile cases in transit as we had anticipated. In terms of using the cases in 'free time', over half (57%) of the students agreed or strongly agreed with this. This concurs with Sutton-Brady et al's analysis that students have a preference for studying in a familiar home setting '…in reach of other learning related tools and resources...' (Sutton-Brady, 2009). From anecdotal evidence and the qualitative findings from this survey, not presented here, the students' low ratings for this question may be due to issues they encountered when using the mobile cases on hospital computers with Internet Explorer or Firefox browsers. Since the mobile cases were not designed for web browsing on a computer, these students would have had a less than optimal experience.

Students showed a strong preference for the clinical content (as represented by cases and quiz questions) versus the science-based content (contained in the lectures and learning topics). We attribute this preference to two things: 1) the structure used for the mobile cases followed the structure of the clinical reasoning process and it is likely that this was familiar to students and they found it easy to follow. Two-thirds of students answered all the questions in the mobile cases and read the explanations, which supports our previous studies with elearning in which students highly rated the value of answering questions and reading the feedback as a learning strategy (MacLean, Scott, Marshall, & Asperen, 2011); 2) some of the material provided in the learning topics and lectures was quite detailed scientific knowledge, such as immunology, which the students had covered earlier in the curriculum.

With regard to gender, a significant proportion of females found the clinical reasoning tutorials easier to follow and reported using the mobile cases in 'free time'. The results do not support a 'digital native' distinction but are consistent with the literature on the topic (e.g. Bennett, Maton, & Kervin, 2008; see also Margaryan, Littlejohn, Vojit, 2011). 'Digital natives' were less likely to have viewed all the lectures, to have worked through mobile cases while travelling and less likely to have found the mobile cases easy to use. However, 'digital natives' were more likely to have answered all the questions in the mobile cases, read all the explanations and found the structure of the CRS tutorials easy to follow. By contrast, 'digital immigrants' were more likely to have viewed all the lectures, worked through the mobile cases while travelling and were more likely to have found the mobile cases easy to use. However, digital immigrants were less likely to have answered all questions in the mobile cases and read the explanations, and were less likely to have found the structure of the CRS tutorials easy to follow. The lack of conclusive evidence of a digital native distinction concurs with views expressed by Bennett et al '…that a proportion of young people are highly adept with technology and rely on it for a range of information gathering and communication activities. However, there also appears to be a significant proportion of young people who do not have the levels of access or technology skills predicted by proponents of the digital native idea' (Bennett, Maton, & Kervin, 2008, pp. 778-779).

Conclusion

This project was conceived to provide students with flexible access to learning materials, with the expectation that making these materials available on mobile devices would give students the opportunity to consolidate their learning while travelling or on free time whilst on their clinical rotation. Most students reported the mobile cases enabled them to learn new information and revise previous learning, and that the tutorials were easy to follow. However, the survey results showed that students did not engage with them as intended, with only one third of students reportedly using these resources while travelling and just over half using them during free time while

on clinical placement. We also found that more females used them in their free time on placement than males and that the digital immigrants made more use of the mobile cases while travelling than their younger counterparts. The type of device students used also did not affect their experience, which is surprising given that the cases were designed for the Apple iOS. Future research will explore the influence of educational background (first degree qualifications) and other factors on how students perceived the mobile case-based learning scenarios. These findings will assist with future mobile learning design for this and other groups of students.

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Appendix 1

Child and Adolescent Health Specialty Block
Sydney Medical School, The University of Sydney

Evaluation of case-based scenarios on mobile devices

Part 1
1. What is your age? ……

2. What is your gender? (Please circle) Female / Male

3. What is your nationality?
……

4. What is the name of your undergraduate/postgraduate qualifications?
……

5. Do you own a web-enabled mobile device? Yes/ No
If yes, what type? …….....

Part 2
Please choose one of the terms on the right that best describes your response to the statements below:

	strongly agree	**agree**	**neither agree nor disagree**	**disagree**	**strongly disagree**
1. The case-based scenarios for mobile devices were easy to use.					
2. I found the structure of the CRS tutorials easy to follow.					
3. I had no technical difficulties working through the cases.					
Comments:					
4. I answered all the questions in the cases and read the explanations.					
5. I read through all the learning topics.					
6. I viewed all the lectures.					
Comments:					
7. I worked through the cases during free time while on clinical attachments.					
8. I worked through the cases while travelling to and from clinical attachments.					
Comments:					
9. I revised my knowledge by working through the cases.					
10. I learnt new information from the cases.					
Comments:					

Part 3

What was the **best** feature of the cases?

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……
……

What was the **worst** feature of the cases?

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……
……

How could the cases be improved?

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……
……