

WileyPLUS Learning Space Efficacy Research

University of Southern Queensland
Semester 1 2017

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“...IF THE (DIGITAL TEXT)
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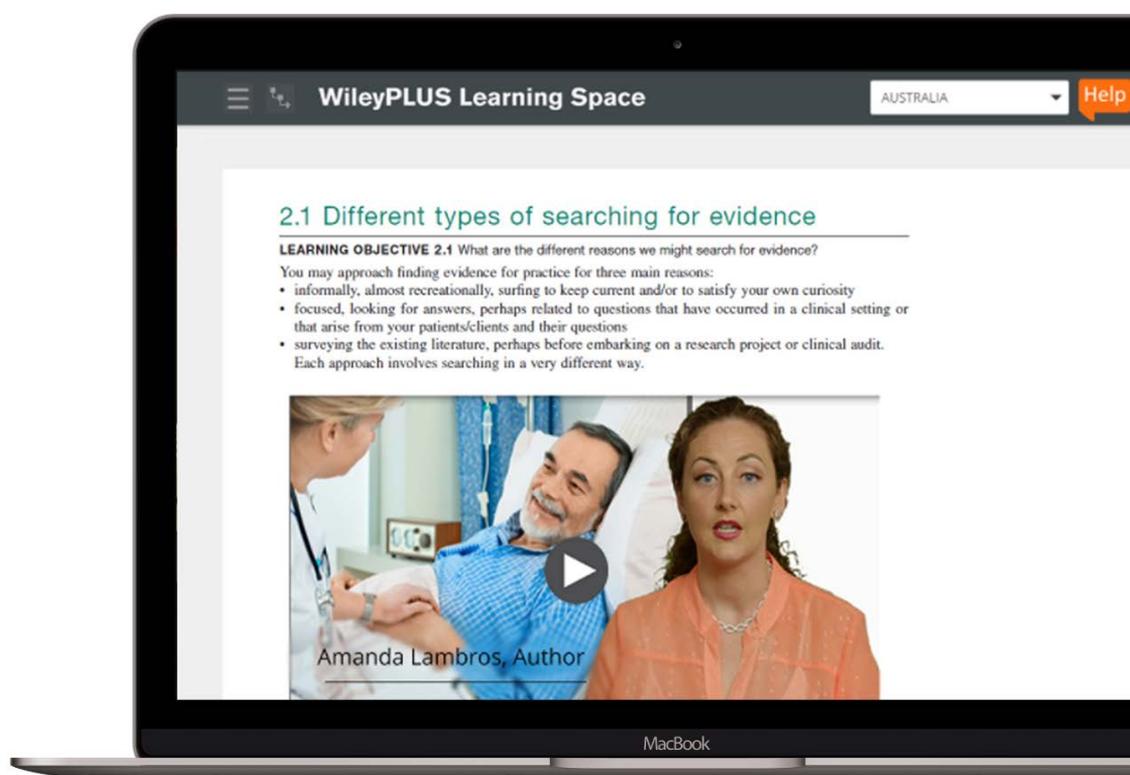


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Key insights

A study from the University of Southern Queensland, School of Nursing and Midwifery, has found that there is a strong positive relationship between the use of the course' prescribed resource, *Understanding Research Methods: For Evidence-Based Practice In Health, 1st Edition* delivered as a WileyPLUS Learning Space online textbook, and student results and engagement in the Evidence-Based Practice course.

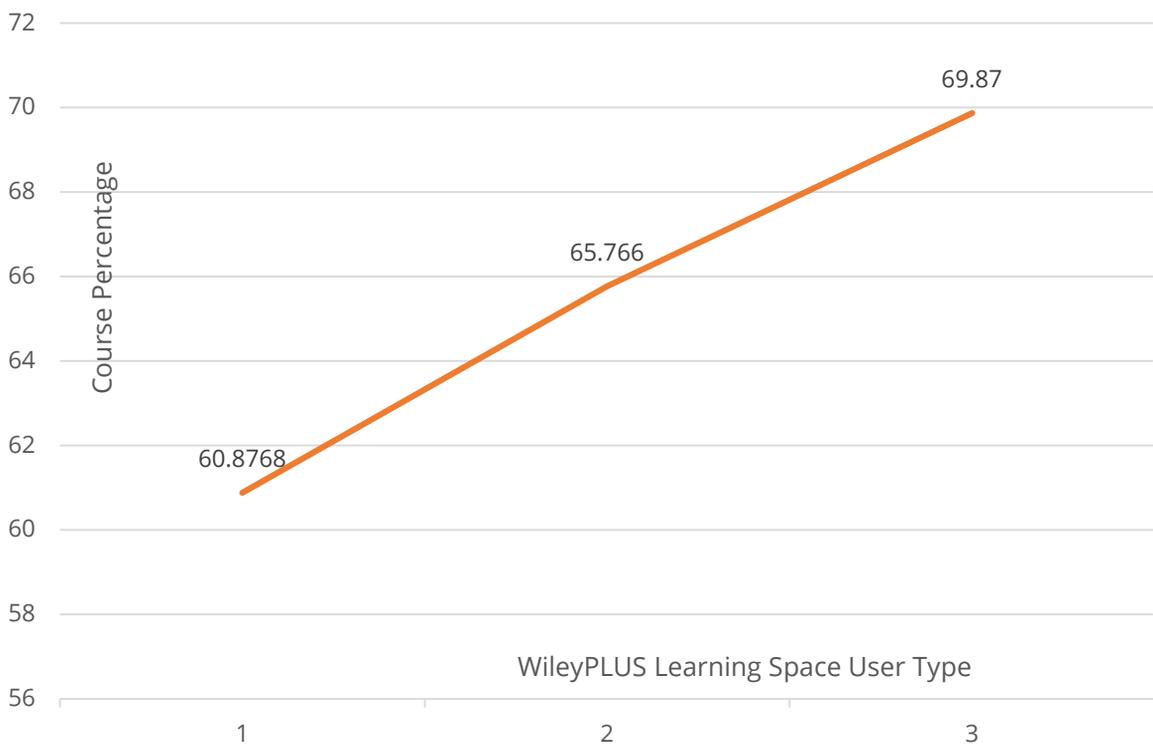
The WileyPLUS Learning Space online textbook is designed to help overcome teaching and learning challenges, such as organizing and accessing resources, building engagement, monitoring progress, and fostering critical thinking skills while building knowledge and proficiency.



This study found that students who purchased and accessed WileyPLUS Learning Space:

- Improved their overall course outcomes, with **100% of students receiving a passing grade** or higher.
- **Achieved higher marks** in the course compared to those who did not access WileyPLUS Learning Space.
- Significantly **increased their overall grade percentage** if they completed the questions in WileyPLUS Learning Space.
- **The more that students completed the self-directed questions** in WileyPLUS Learning Space, **the higher the overall course grade.**

Course Percentage and WileyPLUS Learning Space Questions

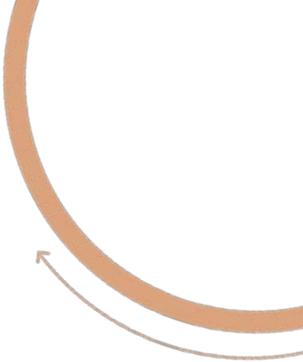


1 = Non user

2 = Average user (WPLS completed questions, 1 – 99)

3 = Super user (WPLS completed questions > 100)

Background



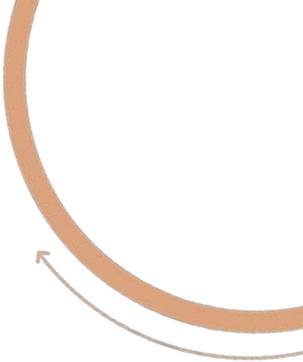
Contemporary nursing practice recognises the importance of integrating evidence-based approaches within clinical practice to improve patient care and outcomes. There can be significant challenges for registered nurses to implement evidence-based practice, which are often related to individual, cultural and organisational factors. While studies have found that nurses are often positive about evidence-based practice, they often lack the necessary skills and knowledge to be able to utilise research findings in practice.

To understand these challenges and how they might be overcome, Wiley partnered with the University of Southern Queensland School of Nursing & Midwifery to conduct a study on undergraduate students completing the Evidence-Based Practice course. At the beginning of Semester 1 2017, the teaching team encouraged students to purchase or access *Understanding Research Methods: For Evidence-Based Practice in Health, 1st Edition* (Greenhalgh et al.) delivered as a WileyPLUS Learning Space online textbook.

This study captures the results of 405 nursing students from the University of Southern Queensland, of which 207 (51.7%) purchased and accessed the resource.

This study aimed to provide important insights into the relationship between the use of WileyPLUS Learning Space and student results and engagement.

Method



Ethics

Ethics approval was obtained from the University of Southern Queensland Human Research Ethics Committee – Approval number (H16REA024)

Sample

A total of 433 students were enrolled in the course in Semester 1, 2017. Of these 50 were classified as first years, 136 second years and 247 third years. The course consisted of 13 weeks teaching and covered the seven key steps of evidence-based practice (see Melnyk et al., 2010). At the end of the semester students who received grades of F (Fail) (n = 13, 3.2%), C (Pass) (n = 187, 46.1%), B (Credit) (n = 133, 32.8%), A (Distinction) (n = 58, 14.3%) & HD (High Distinction) (n = 15, 3.7%) were selected for inclusion in the study. One case was removed due to not having a Moodle score. The final sample was based on (N = 405). Out of the 405 students, a total of 207 (51.1%) students had purchased and accessed WileyPLUS Learning Space.

Data collection

Data were collected at the end of the semester by downloading grade results and engagement analytics from the Moodle Study Desk and WileyPLUS Learning Space. WileyPLUS Learning Space produces a report that provides analytics such as time spent using the product, number of questions answered, and a class participation score. For the purposes of this research, it was decided to not include time spent using the product, as it was thought that this might be an inaccurate figure given that students may open the product and keep it open whilst doing other things. Additionally, only students who purchased and accessed WileyPLUS Learning Space on the study desk were included in this study. It is recognised that some students may have accessed the Greenhalgh digital text via the library, but this does not include the whole system as in WileyPLUS Learning Space.

Overall Course Grade

At the end of the semester, grade percentages were obtained for students enrolled in the course. The overall grade percentage is representative of all semester assessment items for all students enrolled in the course at the end of Semester 1, 2017. The overall course grade is represented as a percentage out of 100.

Moodle Engagement

In this research, a Moodle engagement score was used which represented learning progress against a range of indicators such as assessment activity, forum activity and log-in activity and then is weighted as a risk score. The analytics provided a colour-coded indicator related to the level of risk (i.e. <60 = green, 60 – 80 = yellow, and > 80 = red) where the higher the percentage the less engagement on the Moodle course study desk. The following breakdown of students in these categories were: < 60 (n = 298, 76.5%) and 60-80 (n = 107, 23.5%), >80 (0%). This score was obtained for all students enrolled in the course.

WileyPLUS Learning Space Completed Questions

Though the instructor can assign questions, the students can choose to be self-directed to check their understanding of content material via questions after reading a chapter. To categorise super-users versus users, the study used the median score as a cut-off point from the sample. For example, students who completed 1-99 self-directed questions were categorised as an average user and 100 > as a super user. An additional category of non-user was also created for those that had purchased and accessed WileyPLUS Learning Space but decided not to answer any questions.

WileyPLUS Learning Space Class Participation

This is a percentile score out of 100 and is indicative of the social activities completed by the student, for example answering discussion and perspectives such as 'Have Your Say' questions which open each chapter. Most students appeared to have answered the 'Have Your Say' sections. We categorised scores (1-49 = average user) and (>50 = super user). It should also be noted that whilst some students may have purchased and accessed WileyPLUS Learning Space, they may have chosen to not participate in these activities, creating another category of a non-user.

Data analysis

Students were categorised into those who accessed WileyPLUS Learning Space and those who had not. Descriptive statistics were used across all variables. Correlations were conducted between variables to examine relationships and the use of one-way ANOVA, examining differences between groups. Significance was set at $p < .05$.



Results

Most students in the course on average achieved a passing grade and had a good level of engagement in the Moodle study desk site. Out of those students who accessed WileyPLUS Learning Space, more students completed the self-directed questions than engaged with the additional social activities within the platform (WLPS class participation).

Table 1. Descriptive Statistics (Course Grade, Engagement Analytics)

Variable	N	%	M	Range
Course grade				
WPLS user	207	51.11	67.36	50 – 93
WPLS non user	198	48.89	60.95	21 - 89
Moodle engagement %				
WPLS user	207	51.11	51.50	1-69
WPLS non user	198	48.89	54.62	41-68
WileyPLUS Learning Space completed questions				
Non user	13	6.28	N/A	N/A
Average user (1-99)	94	45.41	52.61	1-98
Super user (100 >)	100	48.31	155.44	100-265
WileyPLUS Learning Space class participation				
Non user	87	42.03	N/A	0
Average user (1-49)	56	27.05	24.84	3-44
Super user (50 >)	64	30.92	75.50	50-100

N.B. Total Course Sample (N = 405), WPLS = WileyPLUS Learning Space

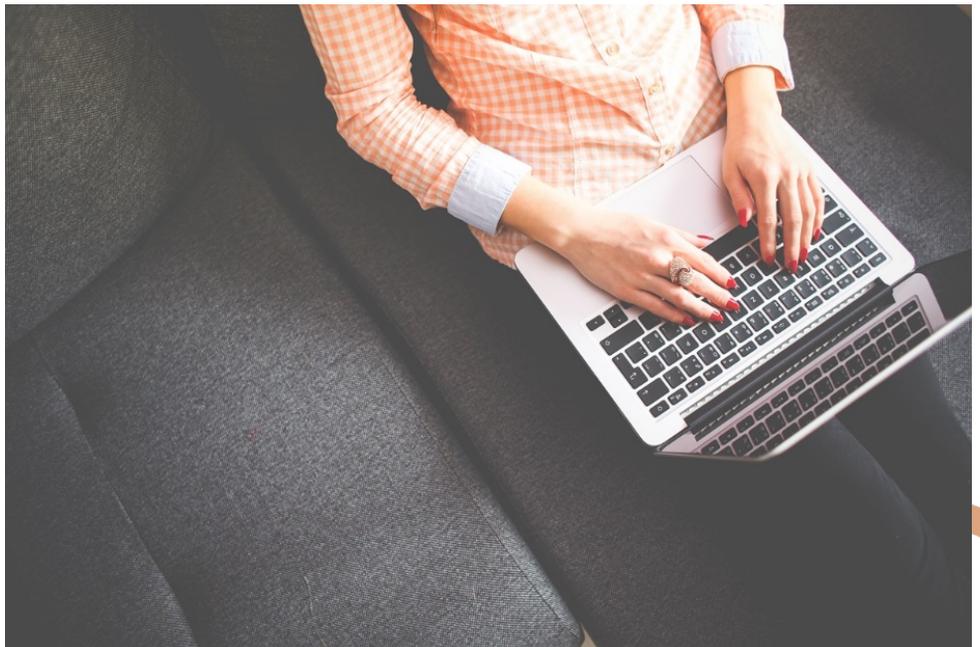
Research Question 1

Does access to the WileyPLUS Learning Space impact on student's overall grade percentage?

Yes. This analysis included all students in the course regardless of whether they had accessed WileyPLUS Learning Space.

An independent samples t-test was conducted comparing those that had accessed (N=207) and not accessed the WileyPLUS Learning Space (n=198) in terms of overall course percentage.

For those that accessed WileyPLUS Learning Space (M=67.36%, SD=9.52), there was a statistically significant difference in terms of overall course percentage compared with those that did not access (M=60.96, SD=10.20), $t(403)=6.53$, $p=.00$.



Research Question 2

What is the relationship between Moodle and WileyPLUS Learning Space engagement and overall course grade?

For this research question, correlation analyses were conducted between the engagement variables and course grade. It can be seen in Table 2 below that the number of WileyPLUS Learning Space questions students completed and their level of Moodle engagement highly and significantly correlated with students overall grade percentage.

That is, the more questions attempted in WileyPLUS Learning Space and the greater involvement in the study desk, the higher the overall course grade.

On the other hand, WileyPLUS Learning Space participation did not significantly correlate with overall grade. Therefore, completing any of the additional social forum tasks within WileyPLUS Learning Space was not significantly correlated with course grade. Given that it alone did not appear to have a strong relationship to grade, it was removed from all subsequent analyses.

Table 2. Correlations between Moodle engagement, WPLS, and course percentage

		Course Grade	WPLS questions	Moodle engagement	WPLS participation
Course grade	Pearson Correlation	1	.257**	-.253**	.144
	Sig. (2-tailed)		.000	.000	.116
	N	405	194	405	120
WPLS completed questions	Pearson Correlation	.257**	1	-.148*	.342**
	Sig. (2-tailed)	.000		.039	.000
	N	194	194	194	115
Moodle engagement	Pearson Correlation	-.253**	-.148*	1	-.236**
	Sig. (2-tailed)	.000	.039		.009
	N	405	194	405	120
WPLS participation	Pearson Correlation	.144	.342**	-.236**	1
	Sig. (2-tailed)	.116	.000	.009	
	N	120	115	120	120

** Correlation is significant at the 0.01 level (2-tailed) | * Correlation is significant at the 0.05 level (2-tailed)

Research Question 3

Of those that accessed WileyPLUS Learning Space, were there differences in overall course grade percentages between the super-users, average-users and non-users?

Yes. A one-way ANOVA was performed to compare the three groups. There was a significant difference between the groups $F(2,402)=30.91$ $p < .00$; $\eta^2=.133$ with a medium effect size. Tukey's Post hoc analysis found that super-users significantly out-performed average users ($p=.003$); and average users outperformed non users ($p<.001$).

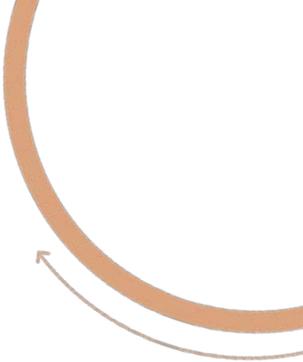
Table 3. Differences in Course Percentages between super, average and non-users for WileyPLUS Learning Space questions

WPLS Completed questions	N	M	Std. Deviation	95% Confidence Interval for Mean		Minimum	Maximum
				Lower Bound	Upper Bound		
non-users	211	60.8768	9.99781	59.5200	62.2336	21.00	89.00
average users	94	65.7660	8.49342	64.0263	67.5056	50.00	88.00
super-users	100	69.8700	9.97943	67.8899	71.8501	50.00	93.00
Total	405	64.2321	10.35678	63.2204	65.2438	21.00	93.00

Table 3 indicates that the super-users obtained higher grades on average ($M=69.87$, $SD=9.98$), than average users ($M=65.77$, $SD=8.49$) and non users ($M=60.88$, $SD=9.99$). The average difference between users and non-users was in effect a grade boundary (i.e. a credit versus a pass). It was also noted that every student that used WileyPLUS Learning Space received a passing grade for the course.

The next analysis involved comparing class participation scores and overall course percentage with super-users ($n=56$) and average users ($n=64$). The results found no statistically significant differences between the super-users ($M=68.61$, $SD=10.07$) and the average-users ($M=66.45$, $SD=9.55$), $t(118)=1.2$, $p=.23$. Given that correlations were not significant this finding was not surprising. Given that it is not correlated means it is unlikely to be a significant predictor

Summary of findings

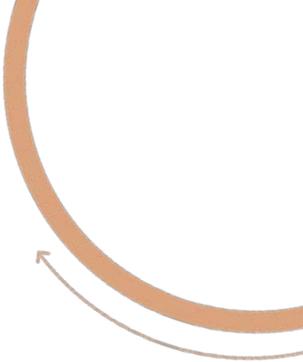


The key findings of this study can be summarised as the following:

- Students who purchased and accessed WileyPLUS Learning Space obtained higher marks in the course than students who did not.
- For students who purchased and accessed WileyPLUS Learning Space, the more that students completed the questions, the higher the overall course grade.
- Completing WileyPLUS Learning Space questions and engaging in the Moodle study desk significantly increased overall course grade.
- Every student that purchased and accessed WileyPLUS Learning Space obtained a passing grade in the course.
- Students who completed questions in WileyPLUS Learning Space, on average, earned a final course grade one boundary difference higher than those who did not.

82% OF STUDENTS REPORTED THAT THEY BELIEVED THE ONLINE TEXT WAS MORE OR SOMEWHAT MORE ENGAGING THAN IT WOULD HAVE BEEN WITH A PRINT TEXT.

Conclusion



Overall, this study found that the more students engaged with the digital resources in WileyPLUS Learning Space the better their course outcomes were. More so, results indicated that all students who accessed WileyPLUS Learning Space successfully passed the course, and those that completed the end of chapter quizzes were more likely to receive higher grades than those who did not.

For students, they believed that engaging with the WileyPLUS Learning Space online textbook had positive benefits on their course outcomes. Students commented on how easy the content was to follow and understand and included clear explanations for difficult concepts. They also found the platform to be highly interactive and helped them better understand and feel more engaged with the course content.

**ALL STUDENTS WHO
ACCESSED WILEYPLUS
LEARNING SPACE
SUCCESSFULLY PASSED
THE COURSE.**

“(THE DIGITAL TEXT) MAKES IT **EASIER TO UNDERSTAND AND PROVIDES MORE DETAIL**” - *STUDENT*

These results are an important consideration for instructors, as these courses are considered traditionally difficult for students, these results indicate that providing access to students significantly enhances their engagement in learning and understanding of content.

Future research

The second phase of this research will include:

- Students in-depth perceptions of the impact of using WileyPLUS Learning Space on their engagement and outcomes in the course.
- An examination of the approaches taken by the teaching team to embed the project into the course, evaluations on uptake, barriers to uptake, observations of engagement and learning in the course by those students who were accessing the product.





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