

Success and Retention in Online and Hybrid Courses Lane Community College Online Teaching and Learning Project Phase I



This concrete and metal sculpture sequence, created by students, represents Lane's vision statement:

Transforming Lives Through Learning

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I. Purpose and Scope

The purpose of this study is to understand the current state and development of Lane Community College's online and hybrid course offerings, particularly with regard to their impact on student completion and success.¹

Using existing data for credit courses from academic years 2003/04 through 2008/09, investigators will describe the growth and distribution of Lane's online and hybrid offerings, compare aggregate completion and success rates in online, hybrid and traditional courses, compare class size and grade distributions among formats, and make focused comparisons between different formats of Writing 121.²

II. Literature Review, Findings and Sources

Sources for information on the size, distribution and growth of distance education programs nationwide include recent studies reported by Allen and Seaman, Wirt et al., and Parsad, Lewis and Tice.³

Public two-year colleges lead all types of degree-granting institutions in the size and growth rate of online enrollments (or registrations) and in the proportion of faculty teaching online.⁴ From Fall 2003 through Fall 2007, online course enrollments grew at an annualized rate of 18.9% while total enrollments grew at 1.5%. In the same 4-year period, online enrollment grew from 11.7% to 21.9% of total enrollment.⁵ "In the 2006–07 academic year, 2-year and 4-year institutions reported an estimated 12.2 million enrollments in college-level credit-granting distance education courses. Of these distance education enrollments, 77% were reported in online courses, 12% were reported in hybrid/blended online courses, and 10% were reported in other types of distance education courses".⁶

A large body of research documents the success of, defined in various ways¹, online and hybrid courses across the curriculum. Often, as in a study similar to ours conducted at Bellevue Community College,⁷ students completing nontraditional courses are shown to do better on at least some success measures—GPA in the case of the Bellevue study—compared to students completing traditional courses. Citing 355 comparative studies on the effects of teaching with or without various technological tools, Thomas Russel,⁸ argues that the preponderance of research shows no significant difference in outcomes for different approaches, leading him to the conclusion that cost should be the main criterion in choosing course formats. Another possible conclusion is that, regardless of the subject and student population, research shows that it is possible to teach and learn effectively using web-based media.

¹ See Appendix A: Definitions

² English Composition-Exposition and Introduction to Argument (WR 121)

³ See Appendix C: References

⁴ Wirt et al

⁵ Allen and Seaman

⁶ Parsad, Lewis and Tice

⁷ Royer

⁸ See Appendix B: Statistical Notes

Among the challenges and problems identified in online education, reduced retention is most broadly noted.⁹ According to Ali and Leeds,¹³ "Retention rates are 20% lower in online courses than in traditional face-to-face courses." Other sources estimate a smaller difference. For the six academic years ending with 2005/06, Bellevue Community College documents aggregate online retention rates between 72% and 75%, trailing traditional courses by 7% to 11%.⁷ The gap decreases during the time period studied, as online retention holds steady while retention in traditional courses slowly declines. Some studies, notably the

Sources such Ali and Leeds assert or demonstrate that retention may be improved by including face-to-face orientations or other face-toface elements in online courses.

ongoing longitudinal Distributed Learning Impact Evaluation led by Dziuban and Moskul,¹⁰ show that retention rates for hybrid courses may approach or equal those of traditional courses.

III. Design

Using existing enrollment data from academic year 2003/04 through Fall 2009, together with completion, success, class size and grade data from 2005/06 through Fall 2009, investigators will prepare:

- 1. A snapshot of Lane's online and hybrid credit course offerings in academic year 2008/09, including the distribution of courses by instructional format, the absolute and relative numbers of enrollments in online and hybrid courses, and a comparison of class size, completion rate, success rate, and grade distributions among online, hybrid, and traditional courses;
- 2. Tables and time plots of credit course enrollments by academic year and course format, showing trends in completion and success rates;
- 3. Focused comparison of success and completion rates between online and traditional sections of Writing 121, a high-enrollment course that has been offered in both formats by many instructors;
- 4. Tests of hypotheses that completion, success or grade distributions differ among course formats, including two-sample *z*-tests of population proportion for completion and success rates and a Chi-square analysis of relative grade distributions;
- 5. Interpretation and discussion of the results.

⁹ In this context, "retention" refers to percent of initially enrolled students who remain enrolled at the end of a course, similar to what is called "completion" at Lane Community College, and not a course-to-course measure of student persistence.

¹⁰ University of Central Florida

IV. **Data Summary**

Registration and grade records were prepared by Lane Community College, Institutional Research and Assessment. To comply with regulatory legislation, and to protect the privacy of students and instructors, data is presented in aggregate form.

Fall 09	Hybrid	Online	College					
Week 2	876	2,965	34,638					
Table 1: Total Enrollmont								

Table 1: Total Enrollment

2008/09	Sections	Week 2	Finish	Completion	Passing	Success	Class Size	% Total	
Hybrid	59	1,374	1,268	92.29%	1,150	83.70%	23.29	1.58%	
Online	313	6,643	6,093	91.72%	5570	83.85%	21.22	7.66%	
Traditional	1,731	42,372	38,985	92.01%	34827	82.19%	24.48	48.86%	
College	4,173	86,724	79,732	91.94%	71890	82.90%	20.78	100.00%	
Table 2. Date Su									

Table 2: Data Summary 2008/09

2007/08	Sections	Week 2	Finish	Completion	Passing	Success	Class Size	% Total	
Hybrid	20	457	409	89.50	364	79.65	22.85	0.64%	
Online	217	5,256	4,630	88.09	4,005	76.20	24.22	7.35%	
Traditional	1,583	35,840	32,998	92.07	29,537	82.41	22.64	50.10%	
College	3,735	71,533	65,475	91.53	58,986	82.46	19.15	100.00%	
Table 2. Date Cu									

Table 3: Data Summary 2007/08

2006/07	Sections	Week 2	Finish	Completion	Passing	Success	Class Size	% Total	
Hybrid	5	98	89	90.82%	75	76.53%	19.60	0.14%	
Online	166	3,798	3,274	86.20%	2,830	74.51%	22.88	5.43%	
Traditional	1,241	26,083	23,719	90.94%	21,366	81.92%	21.02	37.30%	
College	3,843	69,934	63,740	91.14%	57,731	82.55%	18.20	100.00%	
Fable 4: Data Summany 2006/07									

Table 4: Data Summary 2006/07

2005/06	Sections	Week 2	Finish	Completion	Passing	Success	Class Size	% Total
Hybrid								
Online	112	2,729	2,361	86.52%	2,087	76.47%	24.37	3.78%
Traditional	107	1,936	1,752	90.50%	1,593	82.28%	18.09	2.68%
College	3,983	72,138	65,792	91.20%	59,640	82.67%	18.11	100.00%

Table 5: Data Summary 2005/06

		Writing 121				
2003/04	2004/05		2005/06	2006/07	2007/08	2008/09
107	171	Face-to-Face				
107	121	Completion	90.7%	89.9%	89.3%	90.0%
4390	4403	Face-to-Face Success	84.9%	82.2%	83.3%	83.8%
		Online Completion	80.5%	82.4%	83.6%	89.9%
		Online Success	75.8%	75.0%	71.9%	75.6%
	2003/04 107 4390	2003/042004/0510712143904403	2003/04 2004/05 Writing 121 107 2004/05 Face-to-Face 107 121 Face-to-Face 4390 4403 Face-to-Face Success 0nline Completion Online Success	2003/04 2004/05 Writing 121 107 121 Face-to-Face 4390 4403 Face-to-Face Success 0111 Face-to-Face Success 84.9% 0111 Online Completion 80.5% 0111 Online Success 75.8%	Writing 121 2003/04 2004/05 2003/04 2004/05 107 121 Face-to-Face 90.7% 4390 4403 Face-to-Face Success 84.9% 001ine Completion 80.5% 82.4% 001ine Success 75.8%	2003/04 2004/05 2005/06 2006/07 2007/08 107 121 Face-to-Face 89.9% 89.3% <

Table 6: Data Summary Writing 121

VI. Online and Hybrid Credit Course Offerings, 2008/09



Figure 1: 2008/09 Distribution of Course Formats

In academic year 2008/09, Lane's online and hybrid course sections accounted for 7.7% and 1.3% of total credit courses respectively, modest in comparison to the 21.9% of national undergraduate enrollments that Allen and Seaman¹³ attribute to online and hybrid instruction in Fall 2007. Lane's 7.7 to 1.3 ratio of online to hybrid sections mirrors the 77 to 12 national ratio reported for 2006/07 by Parsad, Lewis and Tice,¹³ but the 9 to 15 ratio of Lane's online/hybrid offerings to other distance formats is far short of the 9 to 1 national ratio. In a recent informal survey of 14 Oregon community colleges compiled by the **Oregon Community College Distance** Learning Association, Lane is first in the number of telecourses offered, but sixth in the number of online courses.



Figure 2: 2008/09 Distribution of Online and Hybrid Courses by Department

As Figure 2 shows, in 2008/09 online and hybrid courses were offered in many subjects and departments, but were concentrated in Business, Health Professions, Language, Literature & Communications, and Social Science. They were balanced between Transfer (50%) and Career/Technical programs (42%), with 8% in Apprenticeship.¹¹

Class Size = week 2/sections			2006/07	20	07/08	2008	/09				
	Trac	ditional	21.02	2	2.64	24.4	8				
		Hybrid	19.60	2	2.85	23.2	.9				
		Online	22.88	2	4.22	21.2	2				
2008/09	Α	В	С	D	F	Ι	NC	NP	Р	U	Total
Online	3,257	2,149	1,175	327	466	91	498	119	191	95	8,368
College	39,838	22,523	11,584	3,049	3,554	1,596	6,228	1,850	4,339	1,780	96,341
Hybrid	452	311	165	40	66	4	63	38	74	12	1,225
	Α	В	С	D	F	Ι	NC	NP	Р	U	Total
Online	38.9%	25.7%	14.0%	3.9%	5.6%	1.1%	6.0%	1.4%	2.3%	1.1%	100%
College	41.4%	23.4%	12.0%	3.2%	3.7%	1.7%	6.5%	1.9%	4.5%	1.8%	100%
Hybrid	36.9%	25.4%	13.5%	3.3%	5.4%	0.3%	5.1%	3.1%	6.0%	1.0%	100%

Table 7: Class Size and Grade Distribution

¹¹ This should explain which elements correspond to which discussed groupings.

Online and hybrid classes are similar in size to traditional classes. There is a statistically significant difference among grade distributions in online, hybrid and all-

college courses.¹² As Figure 3 shows, this difference is not dramatic, but online and hybrid grades are comparatively antiinflationary, with fewer "A"s, fewer "I"s (Incompletes), and more "C"s, "D"s and "F"s.



Figure 3: Grade Distributions 2008/09

Online and Hybrid Enrollments

Online and hybrid enrollment for Fall 2009 (not included in Figures 4a & 4b) exceeded 11% of total enrollment, suggesting that this growth spurt is not at and end.

VII. Growth in Online and Hybrid Enrollment

Compared to online and hybrid course offerings at the average U.S. college, Lane's offerings are fewer but increasing rapidly.

Figures 4a & 4b: Trends in Absolute and Relative Growth of Online and Hybrid Offerings

*estimate based on online & hybrid sections/total sections

Online and Hybrid Enrollments as Percent of Total



2,000 1,000 20510^{5} 20510^{5} 20510^{5} 20510^{5} 200810^{5} 1^{2} Chi-square test of independence: $P = 3.10 \times 10^{-59}$

8,000

7,000 6,000

5,000

4,000

3,000

At 5.6% of total enrollments for academic year 2006/07, Lane's online and hybrid offerings were only about a quarter as large as the 21.9% national figure given for Fall 2007 by Allen and Seaman. But in the 3-year period between academic years 2005/06 and 2008/09, Lane's combined online and hybrid enrollments nearly tripled, growing by 294% at an average rate of 43% year on year. During the same period, Lane's total enrollment grew at an annualized rate of 6%. Allen and Seaman¹³ gave 18.9% and 1.5% as national growth rates for online/hybrid and total enrollments, respectively, Fall 2003 through Fall 2007.

VIII. Completion and Success

Completion and success rates in Lane's online and hybrid courses are encouraging. Recall that completion is the rate at which students enrolled in week 2 remain enrolled at the end of a course, and success is the rate at which those enrolled in week 2 earn passing grades of A, B, C or P. As existing research would lead us to expect, Lane's online completion rates tend to trail those of traditional courses with hybrid courses intermediate. But whereas Ali and Leeds¹³ estimate the gap in completion rates between online and traditional courses at 20%, and Bellevue Community College recently experienced online completion rates between 72% and 75%, trailing traditional courses by 7% to 11%, in the last four academic years, completion rates in Lane's online courses have ranged from 86% to 91%. These have never trailed traditional or all-college rates by more than 5%, and recently have been hovering within a margin of 1%, even while college-wide completion rates posted steady slow gains. It must be noted that these comparisons are confounded by uneven distribution of online and hybrid formats among subjects, and by the inclusion in the all-college data of courses (laboratory, cooperative education, self-paced and independent study, etc.) that may not be appropriate for comparison. To provide some control for these factors, the "traditional" comparison group was limited to courses with subject and schedule types represented in the online or hybrid groups. Although data for the traditional group was limited in 2005/06 and 2007/08 due to changes in coding practices (see Appendix B:

Statistical Notes), this group tracks closely with the all-college group and serves to validate the all-college group's comparison value.

While encouraged by the strong showing of Lane's online and hybrid courses, investigators wondered whether the disappearance of completion and success gaps in 2008/09 might be due to confounding factors insufficiently controlled by the criteria of the traditional group. Post-analysis confirmed a conjecture by members of the faculty advisory group that this result is partially explained by recent conversion to hybrid and online formats by certain programs in Health Professions (HP) with cohorts of







highly prepared and motivated students. For example, in Fall 2009 all 16 hybrid sections in Dental Hygiene experienced 100% completion and 100% success. Nevertheless, when HP course are excluded from online and hybrid groups (see Figure 5), online completion rates are approaching, and hybrid rates merging with, college-wide rates (which include HP).

		Compl	etion		Success			
	2005/06	2006/07	2007/08	2008/09	2005/06	2006/07	2007/08	2008/09
Hybrid-		90.82%	88.18%	90.98%		76.53%	77.09%	76.06%
Online-	85.56%	85.34%	87.23%	89.97%	74.75%	72.74%	74.17%	76.97%
ON/HY-	85.56%	85.49%	87.30%	89.31%	74.75%	72.85%	74.41%	76.85%

Table 7: Success and Completion Rates with Health Professions Excluded

Whether the disappearance of the completion gap will be permanent, and whether Lane's online courses may actually outperform face-to-face courses in coming years, are matters for speculation. It is clear, however, that Lane's online and hybrid courses are doing well in light of national research on completion and success rates, and that online and hybrid course completion and success rates have recently improved at Lane, both in absolute terms and relative to traditional courses.

As a final measure against apples-to-oranges comparison bias, investigators compared completion and success rates in Writing 121, a high-enrollment course with many face-to-face and online sections (hybrid sections were not analyzed due to small samples). As Figure 6 shows, these results are consistent with the general pattern, with online completion and success rates trailing face-to-face rates by no more that 11%, and the completion gap disappearing in 2008/09.



Figure 6: Completion and Success Rates – Writing 121

IX. Conclusions

Based on data through Fall 2009, it is seen that Lane's online and hybrid course offerings are:

- 1. Modest in size, at 11% of total enrollments, compared with colleges nationally;
- 2. Growing very rapidly, at 43% year on year for the previous three years;
- 3. Represented in many subject areas, but concentrated in Business, Language, Literature & Communication, Social Science and Health Professions;
- 4. Balanced between Transfer and Career/Technical programs;
- 5. Similar in average class size to traditional courses;
- 6. Similar in grade distribution to the college-wide pattern, though comparatively anti-inflationary;
- 7. Trailing traditional courses in completion rate by no more than 5% and 2% respectively during the time period studied, with gaps decreasing over time;
- 8. Posting recent completion rates of about 90% and 92% respectively, similar to the college overall;
- 9. Trailing traditional courses in success rate by no more than 7% and 6% respectively during the time period studied, with gaps decreasing over time;
- 10. Posting recent success rates of about 83%, similar to the college over all;
- 11. Even with high-performing Health Professions courses excluded, seeing increases in completion and success rates which closed to within 3% to 5% of traditional and all-college rates in 2008/09.

Compared to rates reported nationally, completion and success rates in Lane's online and hybrid courses are highly encouraging, as are their recent positive trends. The intense ongoing growth of online and hybrid enrollments is simultaneously an asset and a challenge for the College, creating both an opportunity for positive transformation, and the pressing need for planning and action to address institutional capacity, curriculum development, professional development and student support for online teaching and learning.

Appendix A: Definitions

<u>% total</u>: % of enrollments (week 2/College week 2).

<u>Class size</u>:enrollments per section (week 2/sections).

<u>College</u>:all credit courses, including online, hybrid and other distance formats, but excluding Summer and College Now courses.

Completion: rate at which students remain enrolled from week 2 until end of course (finish/week 2).

Finish:number of students enrolled at the end of the course.

<u>Hybrid</u>:courses in which asynchronous, internet-based instruction is substituted for part of the face-to-face instruction of a traditional course.

<u>Online</u>:courses in which substantially all instruction is delivered through asynchronous, internet media.

Passing:number of passing (A, B, C or P) grades.

Sections: number of individual classes or CRNs.

Success: rate at which students receive passing grades (ABCP/week 2).

<u>*Traditional*</u>: courses in the same subject (e.g. writing, mathematics) and schedule type (e.g. lecture, lab) as at least one online or hybrid course during the same academic year.

• This is intended as a comparison group with traditional formats of courses otherwise similar to courses in the online and hybrid groups. Due to a change in coding practices, this group is smaller in 2006/07 and especially in 2005/06 where "online" courses outnumber "traditional".

<u>Week 2</u>: number of enrollments at end of week 2.

Appendix B: Statistical Notes

In Figure 5, the hybrid data points for 2006/07 are somewhat unreliable due to the small sample, with 95% confidence interval margins of error for completion and success rates of 5.7% and 8.4% respectively. This means that the 2006/07 data points for both hybrid trend lines should be taken with a grain of salt. A conservative approach to both graphs is to compare the college trends with online, excluding health professions, or online and hybrid, excluding health professions trends. All data points on these lines are based on large data sets (maximum margin of error is 1.4% at 95% confidence).

In Figure 6, data points for online completion and success are also somewhat unreliable due to small samples. With online enrollments in Writing 121 ranging from 149 in 2005/06 to 310 in 2007/08 the margin of error for these data points ranges between 6.9% and 3.4% at 95% confidence.

A general approach to accounting for random variability in the success and completion rates is to compare course formats with appropriate statistical hypothesis tests, in this case two-tailed two-sample *z*-tests of population proportion. Table 4 summarizes the results.

DO I	RATES DIFFE	ER?	2-tailed <i>P</i> -value	INTERPRETATION / 95% CONFIDENCE INTERVAL
	la	2005/06	< 0.0001	Yes. Online trails Traditional by 4.0±1.8%.
-	ne/ tiona	2006/07	< 0.0001	Yes. Online trails Traditional by 4.7±1.2%
LION	0nli radi	2007/08	< 0.0001	Yes. Online trails Traditional by 4.0±1.8%.
PLE'	Т	2008/09	0.4254	No. Any difference is less than 1.0%.
COM	1/ nal	2006/07	0.9670	Inconclusive. Small Sample. Hybrid could be -5.9% or $+5.6\%$
Ŭ	ybrid litio	2007/08	0.0434	Yes. Hybrid trails Traditional by 2.6±2.5%
	H T'd	2008/09	0.7075	No, not by much. Hybrid could be –1.7% or +1.2%
	le	2005/06	< 0.0001	Yes. Online trails Traditional by 5.8±2.3%.
	.ne/ tion	2006/07	< 0.0001	Yes. Online trails Traditional by 7.4±1.5%.
SS	Onli radi	2007/08	< 0.0001	Yes. Online trails Traditional by 6.2±1.2%.
CCE	T	2008/09	< 0.0001	Yes. Online <i>slightly leads</i> Traditional by 1.7±1.0%.
SU	1/ nal	2006/07	0.5645	Inconclusive. Small Sample. Hybrid could be –9.9% or +5.2%.
	/bric	2007/08	0.1234	Inconclusive, but suggests Hybrid trails. Hybrid –6.5% to +0.9%.
	H _i H	2008/09	0.1511	Inconclusive, but Hybrid may <i>lead slightly</i> . Hybrid –0.5% to +3.5%.

Table 8: Two-Sample Tests of Proportion

Color indicates statistical significance at α = 0.01, or statistical significance at α = 0.05.

Finally, note that all inferential statistics (confidence intervals and hypothesis tests) reported here are premised on the assumption that the data may be treated as simple random samples taken from large populations. Since the data actually consist of all enrollment or grade counts fitting given criteria (hybrid, online, etc.), the putative populations involved are abstract universes of all results that could conceivably have occurred under a certain set of conditions. For instance, the reported margin of error of 1.8% for the difference between online and traditional completion rates in 2005/06 should be interpreted as a measure of the variability in outcome we would expect if the "experiment" of the 2005/06 academic year was repeated many times.

Appendix C: References

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