
Another Simple Yet Effective Best Practice for Increasing Enrollments at an Extended Campus

Steven S. Christensen
Brigham Young University
steven.christensen@byu.edu

Scott L. Howell
Brigham Young University
scott.howell@byu.edu

C. Giles Hall
Brigham Young University
giles.hall@byu.edu

Abstract

This article is a follow-up to a previous article, “Six Ways to Increase Enrollments at an Extended Campus,” published in this journal (vol. 17, no. 4, winter 2015), wherein a seventh best practice to increase course offerings and increase enrollments at an extended campus is presented. This best practice seeks to identify those areas of greatest student demand in which courses are not consistently offered across all four university semesters. Once identified, these gaps in course availability on the main campus can be filled by offering the courses on the extended campus.

Introduction

In the winter 2015 issue of the *Online Journal of Distance Learning and Administration*, the authors shared some best practices for increasing enrollments in their article “Six Ways to Increase Enrollments at an Extended Campus” (Christensen, Howell, & Christensen, 2015). As this team of administrators and authors continued experimenting with these best practices they realized they overlooked a very important practice facilitated by the advent of big data visualization tools, e.g., Tableau, Datawrapper, Domo. The six strategies previously identified were:

1. Use main campus enrollments to predict courses to offer at the extended campus.
2. Use the main campus waitlist to inform curriculum offerings at the extended campus.
3. Use the Amazon principle of “customers who bought this item also bought...” as a means for offering courses in tandem.
4. Understand how the timing of canceling low-enrolling courses effects enrollments at the extended campus.
5. Identify the best day, and time of day, to offer courses.
6. Identify the courses that students really want to take.

Over the past 18 months Center administration worked to implement the six strategies in an effort to further test their utility. During implementation the administrators identified a seventh strategy (known throughout this article as “course gap analysis”), or best practice, that is useful for scheduling extended campus course offerings. The seventh strategy consists of identifying gaps in course offerings on the main campus and filling them by offering the courses at the extended campus. A gap, in this case, is identified as a course with relatively high enrollments being offered in one or more semesters (or terms; hereafter “semesters” will be used for both) on the main campus but not offered in all semesters. The result is a gap that can be filled by offering the course at the extended campus.

A major task for university administrators at an extended campus is determining which courses to offer and at which times. The BYU Salt Lake Center does not have the ability to offer all 4,000 university courses on the approved course list at the main campus, so it is important that the Center’s administration carefully select courses that achieve the prescribed goals and mission of the Center to extend the early BYU experience (primarily general education courses) to those students who live or work in or near Salt Lake City, Utah.

Purpose

The purpose of this study is to share a best practice emerging at the BYU Salt Lake Center by discussing a strategy for increasing enrollments at an extended campus. Brigham Young University has on its approved curriculum roster 4,020 undergraduate courses, of which some are offered only one semester and others all four semesters (fall, winter, spring, and summer) comprising the academic year. This variability requires proactive monitoring and trend analysis of course offerings on the main campus to better identify gaps that might be filled by offering those courses at the BYU Salt Lake Center. By offering courses at the BYU Salt Lake Center in high demand by students on the main campus the Center will better serve students and better utilize the facility.

Courses in high demand on the main campus, but not offered in a certain semester, create a gap (defined below) in the curriculum offering that can impede student progress and extend the time required to graduate. By filling the identified gap with a high-demand course, student advancement toward undergraduate degree completion and graduation is facilitated. Also, recent studies conducted by Salt Lake Center administration find a majority of the students interested in the Center have other ties (e.g. family, job, internship) to Salt Lake City. By offering courses that fill general education requirements, those students are better served. Further, the Salt Lake Center’s capacity to offer courses and host students is under realized and increasing enrollments will better utilize the facility.

Literature Review

There certainly is a paucity of literature related to selecting a sample of courses to offer at an extended campus (Christensen, Howell, & Christensen, 2015). This deficiency in the literature was further verified after meeting with a subject librarian who aided in a review of the

literature. It is important to reiterate, as first recommended by the authors in the earlier article, that administrators must determine which courses to offer before a scheduling algorithm from the literature is even used.

Similar to selecting a sample of courses to offer at the extended campus, there is also little literature on course gap analysis. Extending the search to business and marketing (Mosey, 2005; Duverger, 2012; and Berry, 2006), there is some discussion about generating new markets or reshaping existing ones, but the application to course offerings at an extended campus is tenuous at best.

In the book *Identifying Hidden Needs: Creating Breakthrough Products*, authors Keith Goffin, Fred Lemke, and Ursula Koners discuss three different types of customer needs: known needs, unmet needs, and hidden needs. It is the unmet needs, those “needs that are known and articulated by customers but not currently addressed by today’s services” (2010, p. 8) that most closely describe the focus of this applied research: course gap analysis. The administrators at the BYU Salt Lake Center assume the needs of students are manifest by overall enrollments and when a high-enrolling course is not offered in one or more semesters at the university an unmet need is identified and an opportunity to offer the same at the BYU Salt Lake Center is identified.

Gaps Discussion

Brigham Young University has three primary venues for course offerings: those offered on the main campus for day continuing (DC) or matriculated undergraduate students, those on the main campus offered after 4:00 p.m. and known as evening classes (EV), and those for students at the BYU Salt Lake Center (SLC).

The administrators at the Center selected a sample of 244 individual courses—typically from the highest enrolling courses on the main campus—which comprise the Center’s course watch list. This carefully chosen sample from just over 4,000 courses at the university consists of general education and service courses that can be reasonably offered at the BYU Salt Lake Center. During an average academic year, the 244 courses are responsible for 128,734 main campus enrollments (DC), 19,086 evening classes (EV) enrollments, and 4,957 Salt Lake Center (SLC) enrollments.

In order to discover gaps in the course offerings, a matrix is created with the help of Tableau, a data visualization software licensed by Brigham Young University. Enrollments for each course are segregated by the previously mentioned delivery groups: DC, EV, and SLC. The enrollments are further segregated by semester and term. The white spaces found in the matrix are gaps in course offerings. The white spaces under the columns labeled SLC could potentially be filled by offering the same at the BYU Salt Lake Center. Table 1 is a sample of four courses extracted from the larger watch list, generated in Tableau.

Table 1. Course Registration Eligibilities by Semesters and Delivery Groups.

	WINTER 2015				SPRING 2015				SUMMER 2015				FALL 2015		
	Enrollment				Enrollment				Enrollment				Enrollment		
	DC	EV	SLC		DC	EV	SLC		DC	EV	SLC		DC	EV	SLC
MATH 112	609	45	14	MATH 112	92	9		MATH 112	114			MATH 112	933	71	12
MATH 118	372		33	MATH 118	115			MATH 118	28			MATH 118	299		8
PHIL 110	184		29	PHIL 110	52			PHIL 110	47		9	PHIL 110	306		23
REL C 200				REL C 200				REL C 200				REL C 200	1999	192	

Course Priorities

Of the 244 courses on the watch list, 97 are currently offered at the Salt Lake Center. The administrators identified 41 courses for its wish list, which is a list of courses of differing levels of priority—e.g., high, medium, or low priority—that are approved. The 41 courses were selected by Center administration, taking into account the willingness of main campus departments to grant approval to offer the courses, the limitations of the facilities (i.e. no classroom set up for advanced music courses), and the ability to find qualified instructors.

If each of the 244 courses were offered in each of the four semesters at the Salt Lake Center, there could be 976 (4×244) possible offerings. Currently, the Center offers approximately 282 of these 976 possible instances, indicating substantial opportunities for growth. Table 1 represents four of those courses across the four semesters, which comprise an academic year. In this example, 16 possible instances (4×4) of offerings at the BYU Salt Lake Center (SLC) could exist, but only 7 actually do. The potential gaps (determined by main campus enrollments) then are 9 ($16 - 7$) courses.

Because it is impossible to fill all identified main-campus gaps at the Center immediately, the authors decided to prioritize the gaps into three groups: high, medium, and low priority. This methodology applied not just to courses to be added, if academic department approval was granted, but also to the timing of when some courses might be offered.

The authors created specific criteria for each level of priority. For a gap to be considered high priority, two conditions must be met. First, the course must enroll at least 295 combined DC and EV class enrollments in at least one semester. The minimum enrollment figure is calculated by averaging the number of enrollments per course in both EV and DC during winter and fall semesters. The average enrollments per course is an indicator of high student demand on the main campus. Courses with less-than-average enrollments are not as likely to generate significant enrollments for the Center, but it is expected that average enrollments (or more) at the main campus will lead to more enrollments at the extended campus.

Second, to qualify as a high priority, a course that meets the first criteria cannot be offered by any of the three registration categories (DC, EV, SLC) during one of the four semesters. Courses that met both criteria were identified as courses with high student demand that are not available to students who would otherwise enroll. These courses present an opportunity for the Salt Lake Center to both satisfy the needs of students and increase SLC enrollments.

Table 2 provides an example of a high-priority course: a course that enrolled more than the requisite 295 students in winter and fall semesters and is not offered anywhere in one semester, summer. In this case, the Center should work with the academic department and its instructors to offer the course during the upcoming summer semester (highlighted in green).

Table 2. High Priority

	WINTER 2015			SPRING 2015			SUMMER 2015			FALL 2015			
	Enrollment			Enrollment			Enrollment			Enrollment			
	DC	EV	SLC	DC	EV	SLC	DC	EV	SLC	DC	EV	SLC	
ACC 200	1024	91	30	ACC 200	157	25	ACC 200			ACC 200	1381	126	32

At this point it would make sense for the Center to simply begin offering all high-priority courses as soon as possible. But despite what the course gap analysis reveals, it is not always possible to offer every desired course. To further prioritize which courses to offer, the administrators attempted to predict enrollments that might result from offering selected new courses. Courses with the potential to generate higher enrollments are targeted.

For high-priority courses, no reliable method for predicting enrollments has been discovered. The administrators decided to add high-priority courses and, over time, compare the enrollment counts with the enrollments on the main campus. They theorized that after offering and tracking high-enrollment courses at the Center, a reliable confidence interval for predicting future enrollments could be determined by comparing extended campus enrollments with the main campus counterpart. However, they also anticipated that high-priority course gaps, when filled, will exceed the medium-priority gap prediction of eight enrollments, as explained below.

For a medium-priority gap, the authors draw upon previous research (Christensen, Howell, & Christensen, 2015) related to Center enrollments as compared to the main campus. Table 3 shows a statistical relationship between the numbers of students enrolled in a DC course and the students enrolled in the same course at the Salt Lake Center. This relationship is found by treating the main campus enrollments as the population and the enrollments at the Center as a sample of that population. Knowing these percentages allows Center administrators to make educated predictions about the number of students who will enroll in a course at the extended campus based on the enrollments at the main campus. It is important to note that the percentages in Table 3 are an average and that other factors, in addition to DC enrollments, influence a student’s decision to enroll in a course.

Table 3. Extended Campus and Main Campus Enrollment Statistics

Sample Mean	Fall 3.48%	Winter 2.94%	Spring 10.08%	Summer 7.55%
-------------	---------------	-----------------	------------------	-----------------

In order to qualify as a medium priority gap administrators determined the predicted enrollments should be at least eight students. The blue-shaded gaps in Table 4 indicate two courses that could be added to the Center’s course portfolio for spring semester. By applying the percentage of 10.08% to MATH 112, the model suggests if the Salt Lake Center added MATH 112, it could expect approximately nine enrollments. The model also indicates that by adding MATH 118, the Center could anticipate approximately 11 enrollments.

Table 4. Medium Priority

	WINTER 2015			SPRING 2015			SUMMER 2015			FALL 2015			
	Enrollment			Enrollment			Enrollment			Enrollment			
	DC	EV	SLC	DC	EV	SLC	DC	EV	SLC	DC	EV	SLC	
MATH 112	609	45	14	MATH 112	92	9	MATH 112	114		MATH 112	933	71	12
MATH 118	372		33	MATH 118	115		MATH 118	28		MATH 118	299		8

A low-priority gap is found using the same rationale as the medium-priority gaps, except for one key difference. The Center accountant (the lead author of this article) has determined that each course needs a minimum of five enrollments to maintain financial viability. For pedagogical purposes, especially in courses that require group work, presentations, and so on, an even greater number of course enrollments is required. For example, one of the associate chairs in the English Department requested that the minimum enrollment in certain courses within their department be at least 10 so as to facilitate more group interaction and work. Thus, courses expected to generate between five and seven enrollments are considered a low priority. The yellow shaded box of Table 5 indicates a low priority gap wherein the Center can expect approximately 5 students to enroll.

Table 5. Low Priority

	WINTER 2015			SPRING 2015			SUMMER 2015			FALL 2015			
	Enrollment			Enrollment			Enrollment			Enrollment			
	DC	EV	SLC	DC	EV	SLC	DC	EV	SLC	DC	EV	SLC	
PHIL 110	184		29	PHIL 110	52		PHIL 110	47		PHIL 110	306		23

Table 6 shows the results of our analysis. The researcher’s identified a total of 34 high-priority gaps that the Center could fill over the duration of the academic year, with most of those opportunities occurring during the summer semester. Nearly half of our results are medium-priority courses with several opportunities to add courses in all four semesters.

Table 6. Results of Analysis

	Winter	Spring	Summer	Fall	Total
High	4	9	20	1	34
Medium	14	10	9	18	51
Low	11	8	2	13	34
Total	29	27	31	32	119

Application of the Gap Analysis

After conducting the gap analysis in preparation for the spring semester course offerings, Center administration identified one high-priority gap,

two medium-priority gaps, and one low-priority gap, each of which could be filled by offering the course at the Center. Table 7 reports the results of adding these four courses to the portfolio: MATH 112 (medium-priority gap, shaded in blue), MATH 118 (medium-priority gap, shaded in blue), PHIL 110 (low-priority gap, shaded in yellow), and REL C 200 (high-priority gap shaded in green). The enrollment predictions for each course are also included in the table.

Table 7. New Offerings with Enrollment Predictions

	WINTER 2015				SPRING 2015				SUMMER 2015				FALL 2015		
	Enrollment				Enrollment				Enrollment				Enrollment		
	DC	EV	SLC		DC	EV	SLC		DC	EV	SLC		DC	EV	SLC
MATH 112	609	45	14	MATH 112	92	9	9	MATH 112	114			MATH 112	933	71	12
MATH 118	372		33	MATH 118	115		12	MATH 118	28			MATH 118	299		8
PHIL 110	184		29	PHIL 110	52		5	PHIL 110	47		9	PHIL 110	306		23
REL C 200				REL C 200				REL C 200				REL C 200	1999	192	

Results

As indicated in Table 8, the realized enrollments for the selected courses met or exceeded expectation, with exception of MATH 112. It was further noted that REL C 200, a high-priority course with no enrollment expectation, generated 23 enrollments, the highest of any of the added courses.

Table 8. Expected and Actual Enrollment Comparison

Course	Expected Enrollment	Actual Enrollments	Difference
MATH 112	9	7	-2
MATH 118	12	13	1
PHIL 110	5	8	3
REL C 200	No Expectation	23	23

Conclusion

Utilizing big data analysis tools such as Tableau has made it possible to introduce a seventh strategy, known as “course gap analysis,” to help increase enrollments at an extended campus of a major university. This strategy has already proven to be useful for scheduling extended campus course offerings. The seventh strategy involves identifying gaps in the course offerings on the main campus and filling them by offering the courses at the extended BYU Salt Lake Center. The result is an increase in enrollments at the extended campus and a more robust selection of course offering for students on the main campus. This strategy is generalizable to other academic institutions that extend academic offerings to satellite campuses or extension centers. As with the six previously identified strategies, further experimentation with this seventh strategy will occur in future semesters. Finally, the authors invite others to share their best practices in this area of enrollment management and maximization within the extended campus community.

References

- Berry, L. L., Shankar, V., Parish, J. T., Cadwallader, S., & Dotzel, T. (2006). Creating new markets through service innovation. *MIT Sloan Management Review*, 47(2), 56.
- Christensen, S. S., Howell, S. L., & Christensen, J. (2015). Six ways to increase enrollments at an extended campus. *Online Journal of Distance Learning Administration*, 18(4).
- Duverger, P. (2012). Variety is the spice of innovation: Mediating factors in the service idea generation process. *Creativity and Innovation Management*, 21(1), 106–119.
- Goffin, K., Lemke, F., & Koners, U. (2010). *Identifying hidden needs: Creating breakthrough products*. New York City, NY: Palgrave Macmillan.
- Mosey, S. (2005). Understanding new-to-market product development in SMEs. *International Journal of Operations & Production Management*, 25(2), 114–130.