

Data-driven Analyses of WOU Curriculum

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We have been having an on-going campus conversation for several years about the curriculum at WOU and whether or not our curriculum includes unnecessary obstacles to students. In my mind, unnecessary obstacles are structural aspects of our curriculum that either reduce graduation rates or increase the number of credits that students have at graduation. Conversations about our curriculum have, as would be expected, centered around our different perspectives on the value of curricular requirements, but we have not had much data to drive our discussions. In an effort to identify where problems might be within our curriculum and to understand the impacts of possible solutions, I have done a number of different data analyses over the past year. Because the time is approaching when we, as faculty, need to make decisions about the direction of our curriculum, I feel that other faculty might be interested in my analyses. As a faculty member, my time and access to data for these exercises are limited; however, I am happy to share the data I have used to perform the following analyses and am happy to answer any questions. I also invite other faculty and administrators to share data that expands, compliments, or contradicts the data I present below.

How many credits do students at WOU graduate with, on average, and how does this compare to other institutions?

Several years ago, the Academics Requirement Committee (ARC) was given data for the number of credits at graduation for different majors at WOU. In order to understand what factors contributed to the average credits at graduation, I examined the major requirements as listed in the WOU Course Catalog for 43 majors at WOU (37 from the College of Liberal Arts and Sciences, 6 from the College of Education). Of those majors, students from the College of Liberal Arts and Sciences graduate with an average of 207 credits and students from the College of Education graduate with an average of 212 credits. Nationally, education degrees tend to be about 5 credits larger than liberal arts and sciences degrees, so the difference between our College of LAS and COE averages is to be expected. It is important to note that these averages are not weighted based on the number of students graduating from each degree; in other words, a major that has one student graduating with 180 credits would impact the average as much as a major with 100 students

graduating with 240 credits. Nonetheless, the average credits at graduation across the majors I examined is comparable to the average credits at graduation that have been presented by our administrators previously at Faculty Senate.

According to College Completion America, the national average for total credits at graduation is 205 (all credits in this document are adjusted for the term system). At first glance, it appears that WOU students graduate with 2-7 more credits than the average. However, WOU transfer students come in with an average of 99 credits, but over half our transfer students come from Chemeketa Community College. Chemeketa transfer students have an average of 102 credits when they arrive at WOU. Additionally, Pell Grant students take longer to graduate, and WOU has a greater percentage of Pell Grant students than the national average (41% vs. 34% respectively).

When the high number of education majors at WOU, the number of students from Chemeketa, and the number of Pell Grant students at WOU are considered, the average number of credits at graduation at WOU is close to what I would expect, and maybe slightly above the national average. However, while average isn't bad, I don't think average should be our aspiration.

If we agree that it is worthwhile to look at our curriculum to see how we can reduce the number of credits students have at graduation, then we can look at the curriculum from a number of perspectives. Are majors at WOU larger, in terms of credits required, than the same majors at similar institutions? Are our general education curriculum (LACCs and BA/BS) requirements larger, in terms of credits required, than the general education requirements at similar institutions? What is the impact of the required minor? However, before we ask any of these questions, it is important to know if changing the curriculum would even make a difference for students. Therefore, I started with the big question of whether or not the number of credits required in a degree is correlated with the number of credits at graduation.

Is the number of credits required in a degree is correlated with the number of credits at graduation?

It might seem obvious that the more credits that are required, the more credits students tend to have at graduation; however, if every student needs a minimum of 180 credits, maybe it doesn't matter how many of those credits are prescribed for them and how many are electives.

While chairing the ARC, the WOU administration provided the committee with data regarding the average credits at graduation by major. I reviewed the 2015-16 catalog to determine:

- the number of credits required by each major for both BA and BS students, and;
- the number of general education credits required for each major after accounting for “double-dipping” (i.e., I subtracted credits that could be applied to both the major and the LACCs).

I also included 27 credits for a minor, unless a degree did not require a minor. I then used the 2016 commencement program to estimate how many students in each major were graduating with BA or BS degrees to calculate a value I named “directed credits”. For example, for a given major, if the BA degree required 170 credits and the BS required 150 credits, and 50% of graduates with that degree received a BA, then the directed credits for the major was 160.

I found that both the number of credits in the major and the total number of directed credits were significantly correlated with the average credits at graduation ($p = 0.001$ and $p = 0.0005$, respectively). Looking at the data, it appeared that there were three data points that could be outliers and could be driving the correlations because they had an unusually high number of average credits at graduation (Contemporary Music (233), The Arts (241), and the Art BFA (251)). By calculating quartiles, I determined that The Arts and the Art BFA were outliers, so I re-ran the regression analyses without the BFA and The Arts.

For the correlation between the average credits at graduation and the number of credits in the major, the relationship was still significant if the Art BFA and The Arts were removed ($p = 0.04$). For the correlation between the average credits at graduation and the number of directed credits, the relationship was again still significant when I removed the Art BFA and The Arts ($p = 0.005$; Figure 1).

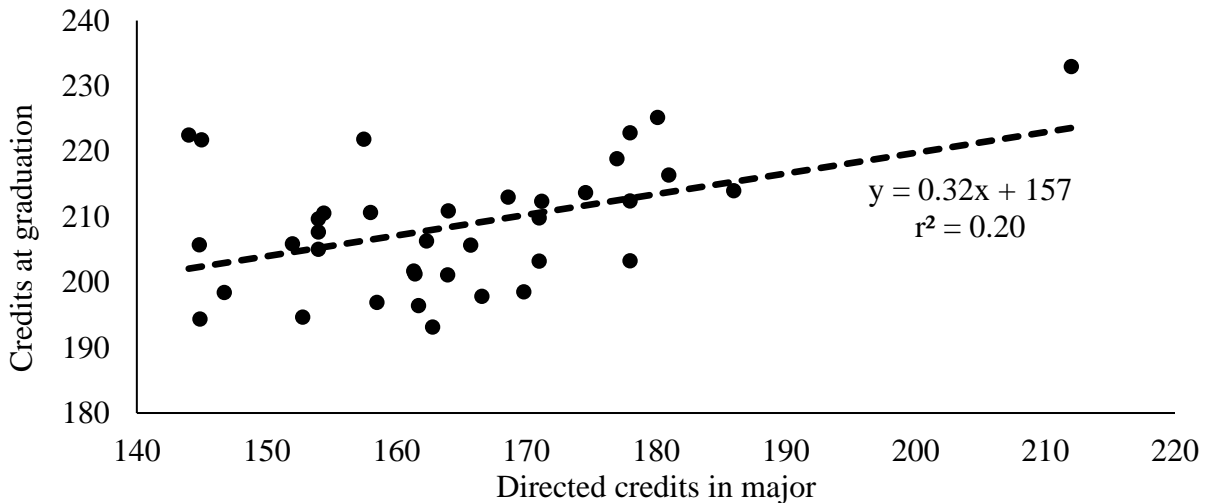


Figure 1: Correlation between the number of “directed credits” (major credits, BA/BS credits, LACC credits, and minor credits) in a degree and the average number of credits students have at graduation. Outliers were removed for this figure, but the relationship is similar with the outliers.

What impact does a required minor have on the average number of credits at graduation?

Based on the relationship between the average credits at graduation and the number of directed credits, every “directed credit” removed—be it from the major, minor, or general education curriculum—would be expected to reduce the average credits at graduation by 0.3 credits (95% confidence range: 0.1-0.5 credits). Therefore, removing a 27-credit required minor from a degree program without adding additional required credits would be expected to reduce the average credits at graduation by 8.5 credits (95% confidence range: 2.8-14.3 credits). This should not be interpreted as a prediction that removing required minors would reduce the average credits at graduation for the university by 8.5 credits for a number of reasons:

1. Not all students are currently required to have a minor (e.g. Interdisciplinary Studies majors).
2. Some percentage of students would choose to pursue a minor even if the minor were not required. I don’t have access to this data from other institutions, but it would be good information to have to allow us to predict the impact on our programs.
3. Some degrees would add credits to compensate for no longer having a required minor. For example, Biology might adapt by having some degree tracks require more credits

because we currently have students take a Chemistry or Physical Sciences minor if they want to apply to medical school or graduate school.

The question that cannot be answered by this analysis is whether or not the benefit of a minor outweighs the reduction in required credits. For an in-state student, one credit costs about \$170. Removing the minor requirement could save in-state students an average of \$1400 (8.5 credits x \$170). Does the benefit of a required minor exceed \$1400, on average? I have done a brief search looking for evidence that minors improve student success on the job market, but have not found any information other than anecdotes. If someone knows of data showing a measurable benefit of minors, I would love to see that data!

Are our major curricula too large compared to majors at similar institutions?

I examined the number of credits in similar degrees at three different institutions. I will explain why I chose these particular institutions in more depth below, but the three institutions were Southern Oregon University, the University of Wisconsin-Parkside, and Cal State University-Stanislaus. The number of credits in our majors were significantly correlated with the number of credits in the same majors at Southern Oregon ($p = 0.02$) and Cal State-Stanislaus ($p = 0.002$), and approached significance when compared to UW-Parkside ($p = 0.06$). Moreover, the average number of credits in the majors analyzed was similar across institutions (Figure 2). This suggests that our majors, in general, are similar in size to the same majors at comparator schools.

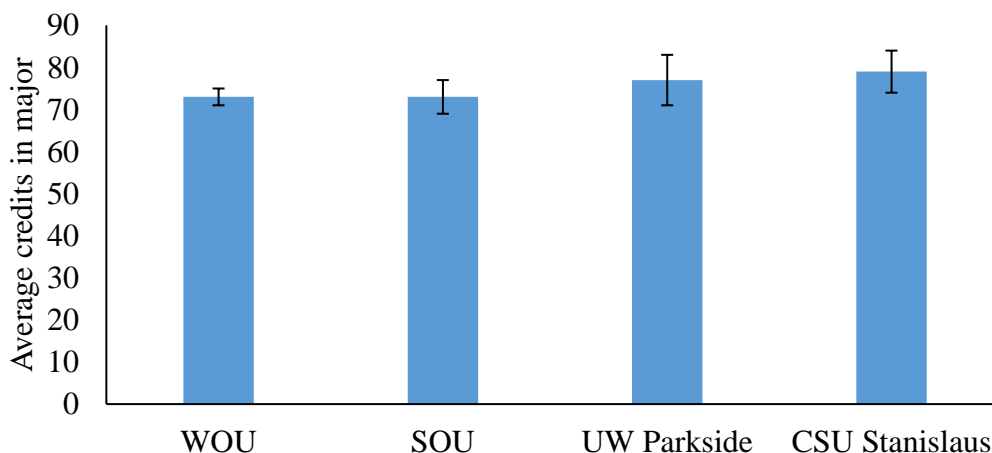


Figure 2: Average number of credits in similar majors. Error bars = s.e.m. WOU (n = 21); SOU (n = 16); UW Parkside (n = 21); CSU Stanislaus (n = 18).

Is our general education curriculum (BA/BS requirements + LACC) too big?

The general education curriculum at WOU includes the LACC requirements, the BA/BS requirements, and the W and D requirements. Because most students can get their W and D requirements while taking LACC and major courses, I ignored those credits and counted our “Gen Ed” as the BA/BS requirements and the LACC requirements. I then examined 19 other 4-year institutions to see how they structured their degrees. I used the list of peer institutions that is available on the WOU website, the former OUS institutions, and three Oregon liberal arts colleges (Reed, Lewis & Clark, and Willamette). I found that there were three types of models for BA and BS degrees:

1. Students have Gen Ed requirements + BA or BS requirements + major requirements. This is the model WOU and SOU use, except WOU currently also has minor requirements for most degrees.
2. Students have Gen Ed requirements + major requirements, and academic units decide what makes a BA or BS degree for a particular major. For example, Cal State-Stanislaus offers both BA and BS degrees in Biology. The BS is larger (122 credits) and requires more math, chemistry, and physics. The BA is 83 credits.
3. Students have Gen Ed requirements + major requirements, and each major is offered as either a BA degree or a BS degree. BA degrees are generally smaller. For example, at the University of Wisconsin-Parkside, BA degrees average 60 credits, while BS degrees average 99 credits. However, the number of credits for BA and BS degrees varies widely across disciplines. BA degrees require 50-92 credits, while BS degree require 59-126 credits.

I also found that most institutions (79%) have a second language requirement, although sometimes that language requirement is for BA degrees only and sometimes it is for all students. Of the schools that require a second language, the average number of required language credits is 19.

To see how our general education and BA/BS requirements compare to other schools, I chose one comparator from each of the degree models: SOU from model #1 above, Cal State-Stanislaus from model #2, and UW Parkside from model #3. I was able to identify 15 majors that were common between all three institutions. At WOU, our LACC requirements are relatively

small, but our BA requirements and required minor make our BA degrees much larger than these comparator schools (Table 1). Please note that the tables below do not account for double-dipping—general education courses that also count as major or minor requirements; if those credits are similar across institutions, the total number of credits would be smaller but the general relationship between institutions would remain the same. In contrast to our BA degrees, BS degrees at WOU are of similar size to BS degrees at these comparator institutions (Table 2).

Table 1: Credit breakdown for BA degrees for WOU and three comparator institutions.

Institution	Major credits	LACC credits	BA specific credits	Minor credits	Total
UW-Parkside	59.5	79.5			139.0
CSU-Stanislaus	73.4	76.5			149.9
SOU	74.1	61	24		159.1
WOU	73.3	54	30	27	184.3

Table 2: Credit breakdown for BS degrees for WOU and three comparator institutions.

Institution	Major credits	LACC credits	BS specific credits	Minor credits	Total
SOU	74.1	61	7		142.1
WOU	73.3	54	11	27	165.3
CSU-Stanislaus	101.4	76.5			177.9
UW-Parkside	98.8	79.5			178.3

To put these data in perspective (i.e., so what if our degrees are large as long as our students are doing better than students from these other schools?), I attempted to get data to compare our students to students from SOU, UW-Parkside, and CSU-Stanislaus. I used the website CollegeFactual.com to obtain data on first-year (or freshman) retention rates, 6-year graduation rates, and lifetime earnings after graduating. We have a lower retention rate than the other three institutions, but have comparable 6-year graduation rates and lifetime earning statistics (Table 3). College Factual did not have data for SOU on lifetime earnings, but the PayScale Return on Investment (ROI) report using data from 2010 showed that WOU graduates have slightly higher lifetime expected earnings than SOU graduates.

Table 3: “Performance” statistics for WOU and three comparator institutions.

Institution	First-year retention rate	6-year graduation rate	Earnings surpass average high school graduate after...	Return on Investment
CSU Stanislaus	81%	55%	23 years	11.5%
SOU	72%	37%	n.a.	7.5%
UW Parkside	74%	33%	22 years	9.1%
WOU	69%	44%	25 years	7.9%

A final important point to keep in mind as we discuss revisions to our general education curriculum, is that our LACCs and our BA/BS requirements are currently intertwined. My analysis of the relationship between directed credits and credits at graduation indicate that every “directed credit” removed would be expected to reduce the average credits at graduation by 0.3 credits. For the sake of argument, let’s assume that WOU decides to have a 60-credit general education curriculum, a 12-credit BS-specific requirement, and a 12-credit BA-specific requirement. Such a change would be expected to decrease the number of credits at graduation for students with BA degrees by 3.8 credits, but would increase the number of credits at graduation for students with BS degrees by 2.2 credits.

So, what do we do with our curriculum?

I have my opinions on what we should do with our curriculum, but my intention with this document is to provide data for discussion. Even if I did state my opinions, the value of curricular requirements is subjective. We can be fairly confident that every required credit added to the curriculum will increase the time and money it takes for students to graduate. We can also be confident that most of our required credits are beneficial to students; research shows that students who earn bachelor’s degrees get better jobs and make more money than if they do not have a degree. The data for WOU is consistent with these findings, at least in relation to salaries—as mentioned above, WOU graduates out-earn students with a high school degree after 25 years and the 30-year return on investment for WOU students is 7.9%. Where is the proper balance? How many required credits do students need to take in order to get the benefit from our degrees without taking excess credits? We owe it to our students to create a curriculum that allows them to achieve the goals we set for them without creating unnecessary obstacles to their graduation.