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3

Faculty: reflect on the composition, qualifications and development of the faculty

A.

Provide information on

Quantity and quality of the faculty needed to meet the needs of the program/discipline.

The total number of full time faculty at all campuses between 2011 and 2013 varied between 36 to 41 and the part time faculty varied between 143 to 158 on any given term, not including Summer. The percent of *all* courses (pre-college and college level) taught by full-time instructors during this time period varied from a low of 24.9% at Cascade to a high of 41% at Sylvania (see ??).

From the academic year 2008 to 2012 there was a significant increase in the number of students taking math courses at all campuses as shown ??.

TABLE 3.1: Percentage of courses taught by full-time faculty from Summer 2011–2013

?(reflect:tab:enrollment)?			
SY	RC	ELC	CA
41%	28.2%	26%	24.9%

TABLE 3.2: Enrollment Difference from AY 08 to AY 12

Campus	Enrollment Difference	% increase
SY	5277	48.59%
CA	3666	64.82%
RC	5333	55.87%
ELC	3171	103.09%

Table J.1 summarizes the breakdown of courses taught by full-time and part-time faculty from Summer 2011–Spring 2013; breakdowns for each of these terms are given in appendix J on page 61.

In reference to “quality of the faculty needed to meet the needs of the discipline,” it is insufficient to look at degree or experience qualifications alone. Even a short list of what we expect from our mathematics faculty would include, but not be limited to that she/he:

- possess an understanding of effective mathematics teaching methodologies and strategies, and be able to adjust in response to student needs
- teach the course content as outlined in CCOGs and with the appropriate mathematical rigor
- show genuine commitment to students’ success
- identify problems when students encounter difficulties learning
- demonstrate an ongoing intellectual curiosity about the relationship between teaching and learning

TABLE 3.3: Summary of sections taught (by campus) from Summer 2011–Spring 2013

		Below 100 level		Above 100 level		Total	
			%		%		%
Cascade	Full-Time	88	21 %	62	36 %	150	25 %
	Part-Time	341	79 %	112	64 %	453	75 %
	Total	429		174		603	
Sylvania	Full-Time	132	21 %	171	43 %	303	29 %
	Part-Time	511	79 %	228	57 %	739	71 %
	Total	643		399		1,042	
Rock Creek	Full-Time	80	12 %	143	38 %	223	22 %
	Part-Time	561	88 %	231	62 %	792	78 %
	Total	641		374		1,015	
South East	Full-Time	65	23 %	26	42 %	91	26 %
	Part-Time	223	77 %	36	58 %	259	74 %
	Total	288		62		350	

- manage classroom learning environments and effectively handle student discipline problems
- demonstrate technological literacy needed in the teaching of mathematics
- participate in professional organizations
- develop, evaluate and revise the mathematics curricula
- serve and contribute to the PCC community as a whole through campus and district wide committees and activities

In addition, with the enormous enrollment increases of the past several years, there are more students than ever needing both remediation in mathematics and guidance in general about what it takes to be a successful college student.

Addressing this section heading directly, the ‘quantity’ of full-time faculty needed to achieve the ‘quality’ goals noted above is currently inadequate. It is primarily the full-time faculty that has the time, resources and institutional support to fully realize the expectations noted above. Part-time faculty are dedicated, but the expectations are different given their compensation. To increase the probability that a student moves successfully through our mathematics courses without sacrificing quality, having a larger full-time faculty presence than currently exists would help with this goal.

In recognizing the need for more full-time faculty, we do not want to downplay the skills and talents of our part-time faculty. We have approximately 150 part-time instructors that serve our students each term many of whom have teaching experience from other colleges and universities; they bring additional experiences from industry, other sciences, high school and middle school education, and so much more. Since they teach such a high percentage of our classes, their success is crucial to our students’ success.

Recommendation: given PCC’s limited resources, the MTH SAC welcomes the input of the administration to help us prioritize our various needs and find/develop targeted and effective professional development for as many faculty members as possible, including part-time faculty.

Extent of faculty turnover and changes anticipated in the next five years.

Since 2011, ten full-time instructors have been hired and eleven full-time instructors have left campuses across the district. Of the eleven full-time instructors who left, five retired, one left to

pursue other job opportunities, and one went back to her other teaching job after the term of the position ended. Three of the retirements occurred at Sylvania and one each at Rock Creek and Cascade. Four full-time instructors left one campus in order to work full-time at another campus. There was one transfer from Cascade to Rock Creek, one from Cascade to Sylvania, one from Rock Creek to Cascade, and one from Rock Creek to Sylvania. In the next five years, similar turnover with full-time faculty is expected.

Since 2011, fifty three part-time instructors have been hired and 35 part-time instructors have left campuses across the district. Of the three campuses, Rock Creek has the most part time faculty turnover, followed by Cascade and Sylvania. Reasons for leaving varied, but at least eight of the part-time instructors who left campuses simply moved to another campus in the district (see appendix K on page 65).

Extent of the reliance upon part-time faculty and how they compare with full-time faculty in terms of educational and experiential backgrounds.

Across the district, the mathematics departments rely heavily upon part-time faculty to teach the majority of the math classes offered. Between 2011 and 2013, 75.1% of the classes at Cascade were taught by part-time instructors, 71.8% at Rock Creek, 72.7% at Southeast, and 59% at Sylvania. This reliance on part-time faculty to teach classes has been a challenge to the departments in a number of ways. First, the turnover of part-time faculty is higher and thus there is a need to orient new employees more frequently and provide mentoring and guidance to them as well. Second, many part-time faculty are on campus only to teach their courses, and thus often do not attend meetings and keep up with current SAC discussions on curriculum. For these reasons, classes have a higher probability to be taught with less consistency than the mathematics SAC would like. Increasing the number of full-time faculty (and thus decreasing the dependence on part-time faculty) would mitigate much of this inconsistency (see appendix J on page 61).

Part-time faculty educational backgrounds vary much more than the full-time faculty backgrounds. Full-time instructors have master's or doctorate degrees in mathematics or related fields with extensive math graduate credits. About a quarter of the part-time instructors have bachelor's degrees and the rest have either a master's or doctorate degree. The part-time instructors come from a variety of employment backgrounds and have different reasons for working part-time. They may be high school instructors (active or retired), may come from a household in which only one member is working full time while the other teaches part time, may be recently graduated MS or MAT students seeking full time employment, may be working full time elsewhere in a non-educational field, or may be retired from a non-educational field (see appendix K on page 65).

How the faculty composition reflects the diversity and cultural competency goals of the institution.

The mathematics SAC is deeply committed to fostering an inclusive campus climate at each location that respects all individuals regardless of race, color, religion, ethnicity, use of native language, national origin, sex, marital status, height/weight ratio, disability, veteran status, age, or sexual orientation. Many of these human characteristics noted above are not measurable nor necessarily discernible. However, PCC does gather data on gender and race/ethnicity, as detailed in ?? (see also the extensive demographic data displayed in appendix P on page 94).

Our SAC will continue to strive toward keeping our faculty body ethnically diverse and culturally competent, but it is an area where improvement is needed. In terms of hiring, it has been well documented that there is a shortage of minorities in the Science, Technology, Engineering and

TABLE 3.4: Racial/Ethnic Make-up of PCC Faculty and Students

	PT Faculty	FT Faculty	Students
Male	54.1%	53.2%	55%
Female	45.9%	47%	45%
Asian /Pacific Islander	7.7%	6.4%	8%
Black or African American	1.1%	0.0%	6%
Hispanic/Latino	2.2%	4.3%	11%
Multiracial	1.1%	0.0%	3%
Native American	0.0%	0.0%	1%
Unknown/International	12.2%	4.3%	3%
Caucasian	75.7%	85.1%	68%

Mathematics (STEM) undergraduate and graduate programs, which makes our recruitment of minority faculty difficult.

Possible recommendations for Program Review:

- Math chairs and deans should strongly recommend that full-time faculty attend workshops related to diversity and cultural competency issues.
- Departments should be encouraged to provide diversity/cultural competency training for part-time faculty as part of their contractual meeting requirements.
- Hiring committees need to work with HR to identify and aggressively target mathematics graduate programs in the Northwest with minority students who are seeking teaching positions in community colleges.
- Departments on all campuses should increase efforts to find candidates for the Faculty Diversity Internship Program [**affirmativeaction**].

B. *Report any changes the SAC has made to instructor qualifications since the last review and the reason for the changes.*

In Spring 2011, prompted by the transfer of Math 20 from Developmental Education (DE) to the Mathematics SAC, the math instructor qualifications were changed. Math 20 had been the only remaining mathematics course in the DE SAC.

The transfer included transitioning three full-time math DE math instructors at Sylvania into the Math Department at Sylvania. At this time, instructor qualifications for math faculty were examined and changed to reflect the inclusion of DE math faculty. It was determined that separate qualifications should be written for pre-college and college level courses. These qualifications were written so that all of the full-time DE math faculty transitioning into the math department (as well as any new DE math faculty hired) were qualified to teach the pre-college level courses and any new math faculty were qualified to teach all of the math courses.

For instance, a masters degree in mathematics education (instead of just mathematics) was included as an optional qualification for full-time instructors teaching pre-college level courses. Also a masters degree in mathematics education became an option for part-time instructors teaching MTH 211-213 (the sequence for elementary education math teachers). Additionally, at the request of the administration, the terms 'part-time' and 'full-time' were removed from instructor qualifications in order to satisfy accreditation requirements. Instead of labeling what

had traditionally been part-time qualifications as 'part-time,' these qualifications were labeled 'Criteria for Provisional Instructors.'

In Winter 2013, the math instructor qualifications were again changed. This time at the request of the math department chairs. The 'provisional' labeling from the last revision had required math department chairs to regularly re-certify part-time ('provisional') instructors. In order to avoid this unnecessary paperwork, the SAC adopted a three-tiered qualification structure based on full-time, part-time, and provisionally-approved part-time instructors (mainly graduate students currently working on graduate degrees). The part-time (non-provisional) tier was labeled 'Demonstrated Competency.'

FIX

Bibliography

- [1] Brewer. “The Effects of Online Homework on Achievement and Self-Efficacy of College Algebra Students”. PhD dissertation. Utah State University, 2009. URL: <http://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=1414&context=etd>.
- [2] Gage. *WeBWoRK accessibility projects*. 2013. URL: <http://michaelgage.blogspot.com/2013/11/webwork-accessibility-projects.html>.
- [3] Hirsch and Weibel. “Statistical Evidence that Web-Based Homework Helps”. In: *MAA Focus* (2003). URL: <http://www-rohan.sdsu.edu/~ituba/math3cw03/webworkfocus.pdf>.
- [4] Hughes and Leavitt. *Accessible Content Creation in Mathematics*. 2013. URL: <http://www.pcc.edu/resources/instructional-support/access/documents/math-accessibilityreport.pdf>.
- [5] “The Mathematics Required of First Year College Students”. In: *National Center on Education and the Economy* (2013), p. 6.



Analysis of sections taught by campus

?{app:sec:analysisPTFT)?

TABLE J.1: Summary of sections taught (by campus) for Summer 2011

		Below 100 level		Above 100 level		Total	
			%		%		%
Cascade	Full-Time	1	3 %	1	6 %	2	4 %
	Part-Time	31	97 %	15	94 %	46	96 %
	Total	32		16		48	
Sylvania	Full-Time	0	0 %	1	3 %	1	1 %
	Part-Time	39	100 %	32	97 %	71	99 %
	Total	39		33		72	
Rock Creek	Full-Time	2	5 %	1	3 %	3	4 %
	Part-Time	35	95 %	31	97 %	66	96 %
	Total	37		32		69	
South East	Full-Time	2	10 %	0	0 %	2	8 %
	Part-Time	19	90 %	3	100 %	22	92 %
	Total	21		3		24	

TABLE J.2: Summary of sections taught (by campus) for Fall 2011

		Below 100 level		Above 100 level		Total	
			%		%		%
Cascade	Full-Time	18	29 %	8	32 %	26	30 %
	Part-Time	44	71 %	17	68 %	61	70 %
	Total	62		25		87	
Sylvania	Full-Time	24	26 %	35	56 %	59	38 %
	Part-Time	69	74 %	28	44 %	97	62 %
	Total	93		63		156	
Rock Creek	Full-Time	15	15 %	27	49 %	42	28 %
	Part-Time	82	85 %	28	51 %	110	72 %
	Total	97		55		152	
South East	Full-Time	9	24 %	4	57 %	13	29 %
	Part-Time	29	76 %	3	43 %	32	71 %
	Total	38		7		45	

TABLE J.3: Summary of sections taught (by campus) for Winter 2012

		Below 100 level	%	Above 100 level	%	Total	%
Cascade	Full-Time	14	22 %	10	45 %	24	28 %
	Part-Time	51	78 %	12	55 %	63	72 %
	Total	65		22		87	
Sylvania	Full-Time	24	24 %	22	37 %	46	29 %
	Part-Time	74	76 %	38	63 %	112	71 %
	Total	98		60		158	
Rock Creek	Full-Time	15	15 %	51	51 %	66	34 %
	Part-Time	82	85 %	49	49 %	131	66 %
	Total	97		100		197	
South East	Full-Time	7	19 %	6	67 %	13	28 %
	Part-Time	30	81 %	3	33 %	33	72 %
	Total	37		9		46	

TABLE J.4: Summary of sections taught (by campus) for Spring 2012

		Below 100 level	%	Above 100 level	%	Total	%
Cascade	Full-Time	11	18 %	8	32 %	19	22 %
	Part-Time	51	82 %	17	68 %	68	78 %
	Total	62		25		87	
Sylvania	Full-Time	23	23 %	24	48 %	47	31 %
	Part-Time	77	77 %	26	52 %	103	69 %
	Total	100		50		150	
Rock Creek	Full-Time	16	17 %	21	40 %	37	26 %
	Part-Time	76	83 %	31	60 %	107	74 %
	Total	92		52		144	
South East	Full-Time	8	22 %	5	56 %	13	28 %
	Part-Time	29	78 %	4	44 %	33	72 %
	Total	37		9		46	

TABLE J.5: Summary of sections taught (by campus) for Summer 2012

		Below 100 level	%	Above 100 level	%	Total	%
Cascade	Full-Time	0	0 %	0	0 %	0	0 %
	Part-Time	29	100 %	14	100 %	43	100 %
	Total	29		14		43	
Sylvania	Full-Time	0	0 %	3	9 %	3	4 %
	Part-Time	40	100 %	31	91 %	71	96 %
	Total	40		34		74	
Rock Creek	Full-Time	2	5 %	1	3 %	3	4 %
	Part-Time	38	95 %	30	97 %	68	96 %
	Total	40		31		71	
South East	Full-Time	8	25 %	1	25 %	9	25 %
	Part-Time	24	75 %	3	75 %	27	75 %
	Total	32		4		36	

TABLE J.6: Summary of sections taught (by campus) for Fall 2012

		Below 100 level	%	Above 100 level	%	Total	%
Cascade	Full-Time	12	20 %	13	57 %	25	30 %
	Part-Time	48	80 %	10	43 %	58	70 %
	Total	60		23		83	
Sylvania	Full-Time	22	22 %	27	51 %	49	32 %
	Part-Time	76	78 %	26	49 %	102	68 %
	Total	98		53		151	
Rock Creek	Full-Time	8	8 %	21	39 %	29	19 %
	Part-Time	89	92 %	33	61 %	122	81 %
	Total	97		54		151	
South East	Full-Time	11	24 %	4	44 %	15	28 %
	Part-Time	34	76 %	5	56 %	39	72 %
	Total	45		9		54	

TABLE J.7: Summary of sections taught (by campus) for Winter 2013

		Below 100 level	%	Above 100 level	%	Total	%
Cascade	Full-Time	16	27 %	11	48 %	27	33 %
	Part-Time	44	73 %	12	52 %	56	67 %
	Total	60		23		83	
Sylvania	Full-Time	18	20 %	28	53 %	46	32 %
	Part-Time	74	80 %	25	47 %	99	68 %
	Total	92		53		145	
Rock Creek	Full-Time	10	10 %	25	50 %	35	23 %
	Part-Time	89	90 %	25	50 %	114	77 %
	Total	99		50		149	
South East	Full-Time	12	30 %	3	30 %	15	30 %
	Part-Time	28	70 %	7	70 %	35	70 %
	Total	40		10		50	

TABLE J.8: Summary of sections taught (by campus) for Spring 2013

		Below 100 level	%	Above 100 level	%	Total	%
Cascade	Full-Time	16	27 %	11	42 %	27	32 %
	Part-Time	43	73 %	15	58 %	58	68 %
	Total	59		26		85	
Sylvania	Full-Time	21	25 %	31	58 %	52	38 %
	Part-Time	62	75 %	22	42 %	84	62 %
	Total	83		53		136	
Rock Creek	Full-Time	12	15 %	21	43 %	33	25 %
	Part-Time	70	85 %	28	57 %	98	75 %
	Total	82		49		131	
South East	Full-Time	8	21 %	3	27 %	11	22 %
	Part-Time	30	79 %	8	73 %	38	78 %
	Total	38		11		49	

K

Faculty Educational Degrees by campus

sec:facultyDegrees)?

Table K.1 shows the highest educational qualifications of full-time and part-time faculty at each of the campuses.

Table K.2 shows the faculty turn over from Summer 2011–Spring 2013.

FIX

TABLE K.1: Faculty Education (Highest Degree)

tab:facultyDegrees)

		Bachelor's Degree	Master's Degree	Doctorate
Cascade	Full-Time	0	8	0
	Part-Time	20	25	1
Sylvania	Full-Time	0	16	2
	Part-Time	16	34	1
Rock Creek	Full-Time	0	10	2
	Part-Time	14	50	4

TABLE K.2: Faculty Turnover from Summer 2011–Spring 2013

tab:facultyturnover)

		Joined	Left	Reason							
				FT retired PT	Re- tired now	FT teach else- where	FT non- teaching	FT other PCC cam- pus	PT other PCC cam- pus	Stay home with kids	
Cascade	Full-time	3	5 ¹	1	1			2			
	Part-time	16	10 ²		1	1			2		
	Total	19	15								
Sylvania	Full-time	3	3	3							
	Part-time	8	6		2	1		2		1	
	Total	11	9								
Rock Creek	Full-time	4	3	1				2			
	Part-time	29	19						6		
	Total	33	22								

¹includes 4 FT temps and 1 FT permanent

²reasons for leaving often unknown or don't fit into these categories

Bibliography

- [1] Brewer. “The Effects of Online Homework on Achievement and Self-Efficacy of College Algebra Students”. PhD dissertation. Utah State University, 2009. URL: <http://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=1414&context=etd>.
- [2] Gage. *WeBWorK accessibility projects*. 2013. URL: <http://michaelgage.blogspot.com/2013/11/webwork-accessibility-projects.html>.
- [3] Hirsch and Weibel. “Statistical Evidence that Web-Based Homework Helps”. In: *MAA Focus* (2003). URL: <http://www-rohan.sdsu.edu/~ituba/math3cw03/webworkfocus.pdf>.
- [4] Hughes and Leavitt. *Accessible Content Creation in Mathematics*. 2013. URL: <http://www.pcc.edu/resources/instructional-support/access/documents/math-accessibilityreport.pdf>.
- [5] “The Mathematics Required of First Year College Students”. In: *National Center on Education and the Economy* (2013), p. 6.