

**SOUTH DAKOTA BOARD OF REGENTS**

**Committee on Academic and Student Affairs**

**AGENDA ITEM: I – C**

**DATE: October 8-9, 2014**

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**SUBJECT: Graduate Production in SDWINS Targeted Fields**

This report highlights recent data with respect to SDBOR graduate production in disciplines leading to professions identified as “high-priority” by the South Dakota Workforce Development Council.

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**RECOMMENDED ACTION OF THE EXECUTIVE DIRECTOR**

Information only.



\*\*\* Special Data Analysis \*\*\*

## *Graduate Production in SDWINS Targeted Fields*

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*The South Dakota Department of Labor website calls attention to roughly thirty occupations that have been identified by the SD Workforce Development Council and SDDLRL as current “critical need” development priorities for the state.<sup>1</sup> Clustered into twelve “target groups”, these professions – including accountants, registered nurses, electricians, and engineers – have been identified by SDDLRL as some of the state’s best-paying and most-demanded occupations. This report highlights recent data with respect to SDBOR graduate production in disciplines leading to these high-priority professions. Specifically, the report examines data through two key metrics: degree completions and in-state workforce placement.*

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### ***Data and Method***

This report integrates data from a sequence of sources. First, the current list of SDDLRL target occupations was reviewed, and the 2010 Standard Occupational Classification (SOC) codes for these professions were gathered from the US Bureau of Labor Statistics website.<sup>2</sup> Information from BLS also was gathered with respect to the typical entry-level educational requirements for these occupations.<sup>3</sup> Next, using the most recent coding crosswalk from the USDOE National Center for Education Statistics (NCES), the 2010 Classification of Instructional Programs (CIP) codes associated with each target occupation were determined.<sup>4,5,6</sup> Finally, these CIP code lists were matched against SDBOR degree completer files, which include CIP code designations for all major fields. In total, the above process allowed for the identification of all Regental graduates whose major field is closely related to an SDWINS target occupation.

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<sup>1</sup> A list of these occupations can be found at [http://dlr.sd.gov/lmic/menu\\_occupational\\_profiles.aspx](http://dlr.sd.gov/lmic/menu_occupational_profiles.aspx).

<sup>2</sup> The SOC system is a hierarchical framework of 6-digit occupation codes published by the US Bureau of Labor Statistics (BLS). See [http://www.bls.gov/soc/major\\_groups.htm](http://www.bls.gov/soc/major_groups.htm).

<sup>3</sup> BLS publishes information regarding the typical educational credential required for entry into each occupation in the SOC system. See [http://www.bls.gov/emp/ep\\_table\\_112.htm](http://www.bls.gov/emp/ep_table_112.htm). It should be noted that BLS’s estimations of “typical” educational requirements often represent the *minimum* qualification for entry into a profession. For example, BLS notes that while registered nurses are assigned an entry-level credential of “associate’s degree” in the SOC system, many employers require registered nurses to hold bachelor’s degrees. Accordingly, BLS estimations of typical educational requirements should be seen as generalizations, not fixed standards.

<sup>4</sup> CIP codes are 6-digit codes that uniquely identify all US postsecondary disciplines. NCES maintains crosswalk files that link SOC codes to their logically- and empirically-related CIP codes. Importantly, many occupations are associated with multiple training programs; likewise, many training programs are associated with multiple occupations. See <http://nces.ed.gov/ipeds/cipcode/resources.aspx?v=55>.

<sup>5</sup> One manual override was made to NCES’s list of CIP codes associated with SOC occupations. With respect to secondary education occupations, the original NCES crosswalk contained CIPs for all subject areas linked to any secondary education field (i.e., general CIPs for biology, English, etc.) The current analysis removed these content-specific CIP codes from consideration, matching instead against CIPs from the CIP-13 “Education” series only.

<sup>6</sup> Appendix A offers a list of all SDWINS target occupations by typical entry-level educational requirement, and also displays the number of CIP codes associated with each SOC code under analysis.

### *Degree Completion Data*

Table 1 shows the number of Regental degrees conferred from FY2009 through FY2013 in fields leading to SDWINS target occupations.<sup>7</sup> It can be seen that degree completions have increased or have held steady in most of these areas over the last five years. The *nurses* cluster represented the largest target group over this period, followed by *accounting/finance* and *teachers*.<sup>8</sup>

*Table 1. Regental Graduates by SDWINS Target Group, by Year*

	<i>FY09</i>	<i>FY10</i>	<i>FY11</i>	<i>FY12</i>	<i>FY13</i>	<i>Total</i>
<i>Accounting/Finance</i>	628	606	606	613	631	3,084
<i>Engineers</i>	89	88	86	99	106	468
<i>Information Technology</i>	74	85	103	126	156	544
<i>Nurses</i>	614	601	597	632	695	3,139
<i>Physicians</i>	47	46	51	51	53	248
<i>Teachers</i>	374	344	410	373	352	1,853
<i>Total</i>	1,826	1,770	1,853	1,894	1,993	9,336

Table 2 displays the same Regental degree completion data summarized above, but segments these data by degree level. Not surprisingly, the vast majority (roughly 85 percent) of the public university system's graduate production in SDWINS target groups has been at the bachelor's, master's and doctoral levels.

*Table 2. Regental Graduates by SDWINS Target Group, by Level*

	<i>Associate</i>	<i>Bachelor</i>	<i>Mast/Spec</i>	<i>Doct/Prof</i>	<i>Total</i>
<i>Accounting/Finance</i>	72	2,388	614	10	3,084
<i>Engineers</i>	0	347	121	0	468
<i>Information Technology</i>	20	419	105	0	544
<i>Nurses</i>	1,333	1,617	173	16	3,139
<i>Physicians</i>	0	0	0	248	248
<i>Teachers</i>	0	1,601	252	0	1,853
<i>Total</i>	1,425	6,372	1,265	274	9,336

<sup>7</sup> Target groups with no Regental graduates (*truck drivers, mechanics, welders, specialty trades, sales representatives*) are not shown. The *supervisors* category is not shown because SDBOR maintains no academic programs in related preparation areas. All degree completion data are reported at the degree major level, meaning that individual students with multiple majors will be counted once for each relevant major. Students may be counted in multiple target groups.

<sup>8</sup> This table understates the number of teacher education graduates produced by the Regental system. Because the matching technique used in this analysis incorporated education-related CIP codes from the CIP-13 series only, this table does not capture any teacher education graduates with a CIP code outside the CIP-13 series. In most years, such graduates account for roughly one quarter of Regental teacher education graduates.

### *In-State Workforce Placement Data*

Table 3 presents data on the in-state workforce placements – one year after graduation – of Regental degree completers in SDWINS target fields.<sup>9</sup> These data refer to all undergraduate- and graduate-level Regental degree completers graduating in FY2009, FY2010, and FY2011.<sup>10</sup> As seen in Table 3, approximately 59.8 percent of these degree completers were placed in the South Dakota workforce one year after graduation. Rates were highest among the *nurses*, *teachers*, and *accounting/finance* occupational groups.

Table 3 also shows median annualized wages for students with a first-year in-state workforce placement.<sup>11</sup> As expected, the highest values are seen for completers in STEM and health fields, while completers from education fields earned considerably less.

It is important to note that these placement rates are conservative in that they do not account for degree completers who are hired out-of-state, are self-employed, are employed by the federal government (including armed services), or are employed outside the three-month query window used in the SDBOR placement analysis. Also, some placement rates and wage summaries may appear artificially low for field-specific reasons. In the *physicians* group, for example, most graduates are engaged in residency training one year after graduation, which often involves working for modest pay at an out-of-state facility. (See the note below Table 3 for more information about this group.)

**Table 3. In-State Workforce Placement Rates by Target Group**

	<i>n Grads</i>	<i>n Placed</i>	<i>Rate</i>	<i>Wage</i>
<b><i>Accounting/Finance</i></b>	1,840	1,068	58.0%	\$35,778
<b><i>Engineers</i></b>	263	87	33.1%	\$46,652
<b><i>Information Technology</i></b>	262	130	49.6%	\$44,900
<b><i>Nurses</i></b>	1,812	1,261	69.6%	\$45,758
<b><i>Physicians*</i></b>	144	14	9.7%	\$52,599
<b><i>Teachers</i></b>	1,128	698	61.9%	\$32,238
<b><i>Total</i></b>	<b>5,449</b>	<b>3,258</b>	<b>59.8%</b>	<b>\$40,437</b>

\* Recent data from the Association of American Medical Colleges suggest that 40.0% of all currently-active physicians in the United States who graduated from USD's Sanford School of Medicine currently practice in South Dakota (AAMC, 2013).<sup>12</sup> Family and general practitioners in South Dakota earn an estimated annual wage of \$207,000; for surgeons, this figure is \$268,000 (South Dakota Department of Labor and Regulation, 2014).<sup>13</sup>

<sup>9</sup> Data are sourced from SDBOR's annual graduate placement analysis, which links data from three main sources: Regents Information Systems (RIS), the South Dakota Department of Labor and Regulation (DLR), and the National Student Clearinghouse (NSC).

<sup>10</sup> These are the three most recent cohorts for whom placement data are available.

<sup>11</sup> Wage summaries exclude students who also were found to be enrolled in one or more postsecondary institutions (e.g., graduate students) as well as those working part-time only (i.e., working less than 35 hours per week at all jobs combined, as suggested by cumulative wage totals).

<sup>12</sup> Association of American Medical Colleges (2013). 2013 State Physician Workforce Data Book. For detailed data, see [https://members.aamc.org/eweb/upload/State%20Physician%20Workforce%20Data%20Book%202013%20\(PDF\).pdf](https://members.aamc.org/eweb/upload/State%20Physician%20Workforce%20Data%20Book%202013%20(PDF).pdf)

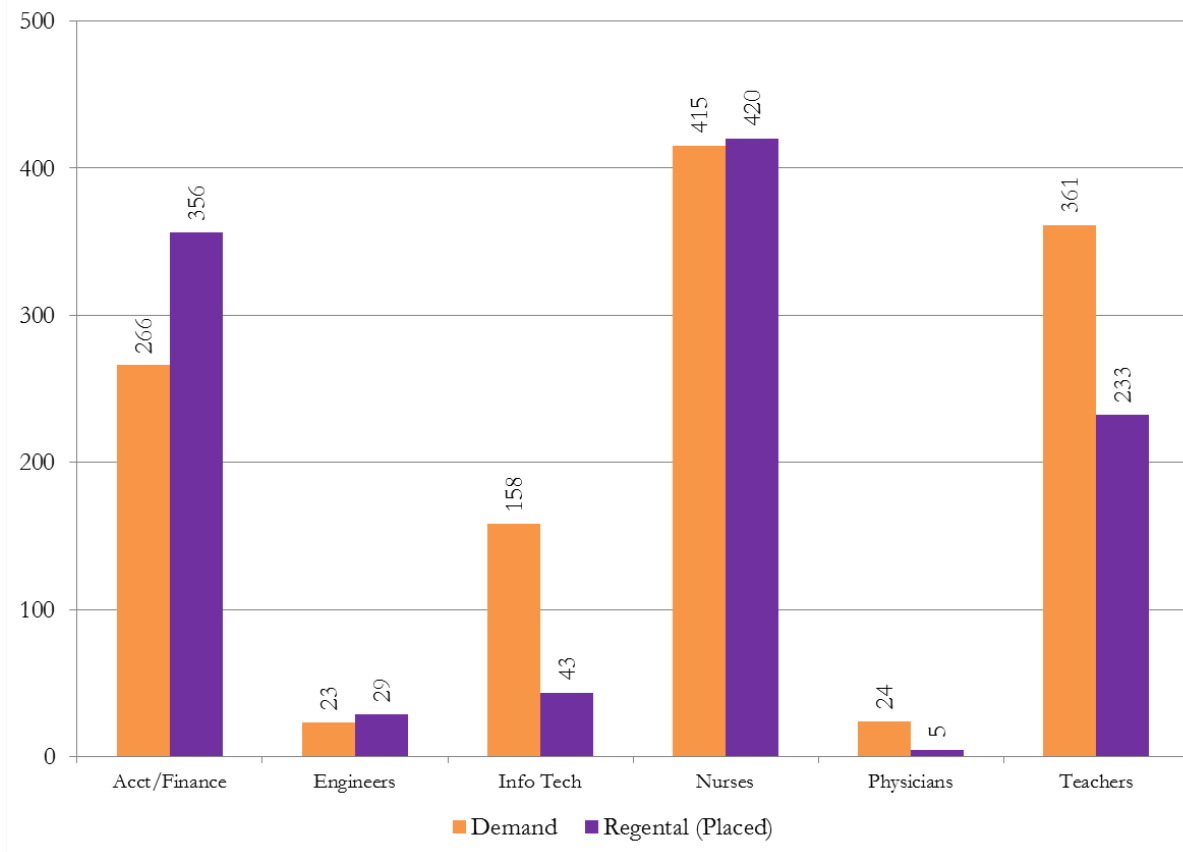
<sup>13</sup> South Dakota Department of Labor and Regulation (2014). South Dakota Occupational Wage Estimates. For detailed data, see <http://apps.sd.gov/ld54lmicinfo/WAGES/OWLISTPUBA.ASP>

Figure 1 (below) considers the above placement data in the context of in-state workforce *demand*. For each SDWINS target group with Regental graduates, Figure 1 displays two values:

- 1) The average annual demand for workers for the 2010-2020 period, as estimated by SDDL. These estimates reflect the projected total number of job openings for both new and replacement workers.
- 2) The average number of Regental graduates from the graduating classes of FY2009, FY2010, and FY2011 who entered the in-state workforce one year after graduation.

These data confirm that the public university system has been a key supplier of workers in many of the state's most-demanded occupations. Among the top three most-demanded SDWINS occupational groups (*nurses, teachers, accounting/finance*), Regental placement figures have aligned closely with anticipated worker demand. In addition, it should be pointed out that for several of these fields – notably *information technology, teachers, and physicians* – the placement figures shown below are likely to understate (due to methodological constraints) the Regental system's success at placing skilled workers in the state's workforce.<sup>14</sup> Actual graduate placement in these areas may be substantially higher than is suggested here.

**Figure 1. SDWINS Target Groups: Average Annual Demand and Regental Placement**



<sup>14</sup> As mentioned previously, the occupational categories shown here do not reflect the totality of Regental degree completers within each nominal category. For example, the SDWINS *information technology* target group is limited to only a small subset of all computer science and technology-related programs in the Regental system.

*Appendix A*  
*SDWINS Target Occupations*

Table A1 below shows a list of all SDWINS target occupations, along with BLS estimations of each occupation's typical entry-level educational requirements. The table also displays the number of 2010 NCES CIP codes associated with each occupation.

*Table A1. SDWINS Target Occupations*

Target_Group	Occupation_Name	SOC_Code	Typical_Educ	CIPs
Accounting/Finance	Accountants and Auditors	132011	Bachelor	7
Accounting/Finance	Cost Estimators	131051	Bachelor	7
Accounting/Finance	Financial Analysts	132051	Bachelor	7
Accounting/Finance	Financial Managers	113031	Bachelor	7
Accounting/Finance	Loan Officers	132072	Bachelor	2
Engineers	Civil Engineers	172051	Bachelor	7
Information Technology	Computer Network Support Specialists	151152	Associate	8
Information Technology	Computer User Support Specialists	151151	Some College	3
Information Technology	Network and Computer Systems Administrators	151142	Bachelor	3
Information Technology	Software Developers, Applications	151132	Bachelor	12
Mechanics	Automotive Service Technicians and Mechanics	493023	HS Diploma	7
Mechanics	Bus and Truck Mechanics and Diesel Engine Specialists	493031	HS Diploma	2
Mechanics	Industrial Machinery Mechanics	499041	HS Diploma	1
Nurses	Registered Nurses	291141	Associate	20
Physicians	Family and General Practitioners	291062	Doct/Prof	3
Sales Representatives	Sales Reps., Wholes. and Manuf., Tech. & Sci. Prod.	414011	Bachelor	1
Sales Representatives	Sales Reps., Wholes. and Manuf., except Tech. and Sci. Prod.	414012	HS Diploma	5
Specialty Trades	Electricians	472111	HS Diploma	1
Specialty Trades	Heating, Air Conditioning, and Refrig. Mechanics and Installers	499021	Cert/Other	2
Specialty Trades	Plumbers, Pipefitters, and Steamfitters	472152	HS Diploma	3
Supervisors	First Line Supervisors of Const. Trades and Extract. Workers	471011	HS Diploma	19
Supervisors	First Line Supervisors of Mechanics, Installers, and Repairers	491011	HS Diploma	6
Supervisors	First Line Supervisors of Office and Admin. Support Workers	431011	HS Diploma	6
Supervisors	First Line Supervisors of Production & Operating Workers	511011	Cert/Other	1
Teachers	Elementary School Teachers	252021	Bachelor	5
Teachers	Middle School Teachers	252022	Bachelor	30
Teachers	Secondary School Teachers	252031	Bachelor	34
Teachers	Special Education Teachers, K8	252052	Bachelor	13
Teachers	Special Education Teachers, Preschool	252051	Bachelor	13
Truck Drivers	Heavy and Tractor Trailer Truck Drivers	533032	Cert/Other	1
Welders	Welders, Cutters, Solderers, and Blazers	514121	HS Diploma	2