

Acknowledgements

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Executive Summary

Overall, Wisconsin teacher preparation programs supplied an adequate number of new teachers to meet the needs of Wisconsin school districts. The total number of program completers from teacher training programs was greater than the number of new hires statewide.

The supply of personnel in a number of licensure/subject areas was inadequate. Shortages were identified in several special education and secondary specialization areas based on data reported by school districts statewide and Wisconsin Department of Instruction.

Several measures indicated an oversupply of personnel in the areas of elementary education, social studies, and physical education.

School districts generally hired emergency licensees as intended, that is, as a limited approach to filling serious personnel needs.

School districts reported significant shortages of substitute teachers and numerous approaches to increase the pool of available substitutes.

Most program completers of Wisconsin public teacher training programs were hired as full-time teachers in Wisconsin public schools.

Findings in this report are similar to national trends in supply and demand of educational personnel.

A national survey found significant variability in supply and demand data collection and reporting methods across states.

This report and additional information related to Supply and Demand of Educational Personnel for Wisconsin Public Schools can be accessed via website. The website is located at: <http://www.dpi.state.wi.us/dpi/dlsis/tel/supdem00.html>

Introduction

Nationally, there were 46.5 million students in elementary and secondary public schools in the 1998-99 school year. Wisconsin made up slightly less than 2% of that total, with approximately 880,000 students. Another 147,000 students were in Wisconsin private schools. Nationally, there were 2.8 million public school teachers, with Wisconsin making up 61,000 of that total. Wisconsin's student-teacher ratio of 15.2 was slightly lower than the national average.

This is the 22nd annual report of Supply and Demand of Educational Personnel in Wisconsin Public Schools. The report serves two functions. One is compliance with the reporting requirements of the federal Individuals with Disabilities Education Act. The second is to provide information for prospective job-seekers, educational administrators, and educational policymakers in Wisconsin.

This report is organized into five sections: (1) Wisconsin Teacher Supply, (2) School District Survey Data, (3) Program Completer Survey, (4) National Supply and Demand, and (5) Employment Outlook In Selected License/Subject Areas. The first section, Wisconsin Teacher Supply, includes an examination of teacher supply based on analysis of program completer data submitted by Wisconsin teacher training programs and teacher attrition rates. The second section, School District Survey Data, includes analyses of supply and demand data collected from 89% of Wisconsin school districts. The section also includes analyses of district emergency license hires and number of emergency licenses issued statewide. In addition, the section includes a detailed report on substitute teacher supply and district strategies to address shortages. The third section reports job status of recent graduates of Wisconsin teacher training programs. The fourth section includes analyses of Wisconsin and national supply and demand data collection, reports, and results. The fifth section provides employment outlooks in selected licensure/subject areas. These outlooks are based on ratings of supply data reported in this study.

Wisconsin Teacher Supply Data

Wisconsin Teacher Supply

Wisconsin's 33 public and private teacher training institutions annually provide the Department of Public Instruction (DPI) with information on program completers. A program completer is an individual that completed a degree or program at a Wisconsin college or university between December 1, 1999 and August 31, 2000 and is eligible to apply for a license to teach in a specific subject area and at specific grade levels. See Tables 1 and 2 for program completer data.

There are several limitations in the use of program completers as a measure of teacher supply. First, an individual may or may not apply for a teaching license. Therefore, program completer data reflect the number of individuals eligible for licensure in an area, but may overestimate the supply of individuals available to teach. Second, an individual may complete one or more programs and be eligible for a license in each area. Teacher training institutions report the individual as one program completer even though the individual is eligible and may obtain two licenses. For example, a student may complete a dual program in elementary and special education and would therefore be eligible to

Table 1
University of Wisconsin System Program Completers

Assignment	UW Eau Claire	UW Green Bay	UW La Crosse	UW Madison	UW Milwaukee	UW Oshkosh	UW Parkside	UW Platteville	UW River Falls	UW Stevens Point	UW Stout	UW Superior	UW Whitewater	Totals for UW System	Totals for Private	Grand Total
Superintendent				5	11							3		19	3	22
Director of Instruction				3	10							3	11	27	18	45
Pre-K through 8	87	67	130	129	264	114	14	50	99	130	69	44	118	1315	540	1855
Agriculture				2				4	34					40	0	40
Family and Con Ed.				5						18	22			45	2	47
Technology Educ											48			48	0	48
Business Education											5	1	17	23	10	33
Marketing Education											22		1	23	10	23
Eng/Sp/Jour	18	13	15	19	18	14	8	4	10	23		4	13	159	70	229
Reading	11		5	8	5	37		6	7	17		7	15	118	78	196
Foreign Language	20	9	3	20	22	15	6	4	1	9			5	114	28	142
ESL		1		1	14	2				20				38	10	48
Math	11	1	4	20	7	4		8	10	13		2	16	96	48	144
Driver Education											32		6	38	0	38
Social Worker				17	20									37	0	37
Music - all areas	22	9	5	17	13	6		8	1	11		3	13	108	40	148
Principal				35	55							34		124	161	285
Physical Education	6		53	6	2	11		16	21	19		11	18	163	23	186
Art Education	7	6	4	24	18	5		2	1	3	10	6	9	95	33	128
Science	14	12	10	24	18	15	4	13	12	32		11	15	180	38	218
School Psychologist	1		19	6	17				7		13	4	20	87	1	88
Social Studies	9	25	13	16	28	24	6	9	20	18		6	22	196	109	305
Dir. Of Special Ed.				7	26							6		39	1	40
Cog/Lrng/Emot Dis.	67		3	32	161	97			5	75	22	12	56	530	69	599
Early Childhood:EEN	21			3	14								9	47	30	77
Speech/Lang Path.	14			22	4	8			23	25			11	107	20	127
Library Media	7		2	11	49	3			1				6	79	0	79
Health Education			7						3	1		1	2	14	0	14
School Counselor				5	49	15		35	23		39	11	3	180	2	182
Grand Totals	315	143	273	437	811	384	38	159	278	414	282	169	386	4089	1334	5423

apply for a license in two areas. Similarly, minor certifications are not included in these data. For instance, a physical education major with a health minor could obtain licenses in both areas but is counted only as a program completer in physical education. Third, these data do not include individuals that complete programs in out-of-state institutions, nor those that completed programs in previous years and did not enter the teaching field. Although use of program completer data as a measure of teacher supply is problematic, analysis of these data provides an opportunity to identify general trends in educational personnel supply and demand

This was the first year teacher training institutions reported the number of program completers who had previous certifications (Tables 3 and 4). These data show that about one-fifth of program completers had previous certifications (1,067 with previous certifications out of 5,423 program completers). More than four-fifths of those with previous certifications were program completers from UW System institutions (866 out of 1,067). Two programs accounted for most of the program completers with previous certifications from private colleges: Marian had 98 principal program completers and Viterbo College had 32 in reading.

Table 2
Private College Program Completers

Assignment	Alverno College	Beloit College	Cardinal Stritch U	Carroll College	Carthage College	Concordia U	Edgewood College	Lakeland College	Lawrence U	Maranatha College	Marian College	Marquette U	Mount Mary College	Mt-Senarico College	Northland College	Ripon College	Silver Lake College	St Norbert College	Viterbo College	WI Lutheran College	Totals for Privates
Superintendent												3									3
Director of Instruction	7		1				3				5	2									18
Pre-K through 8	67	4	75	45	23	28	27	19	1	4	29	45	16	15	10	4	27	58	27	16	540
Agriculture																					0
Family and Con Ed.													2								2
Technology Educ																					0
Business Education						2	3	2		1	1		1								10
Marketing Education																					0
Eng/Sp/Jour	10	1	5	7	2	4	6	4	2	1	2	13	2		2	1		5	1	2	70
Reading			32		6	1						5					2		32		78
Foreign Language			3		3			3	4		1	6	1		1	1		3		2	28
ESL	1	6						3													10
Math	4		11		5	3	3	4	3	5		3					2	5			48
Driver Education																					0
Social Worker																					0
Music - all areas	1			3	4	2		1	10	2	2		2			2	1	7	3		40
Principal	2		43			4	10				98	4									161
Physical Education	3			5	6	1				2						6					23
Art Education	8	1	2	5			2		3		1		3				5	1	2		33
Science			1	5	3	3	4	5	6		1	1	1		1		3	1		3	38
School Psychologist												1									1
Social Studies	7	3	8	4	10	10	4	17	5	4	2	13	1	1	2	5	3	9		1	109
Dir. Of Special Ed.							1														1
Cog/Lrng/Emot Dis,			6		17		18										28				69
Early Childhood:EEN			14				11										5				30
Speech/Lang Path.												20									20
Library Media																					0
Health Education																					0
School Counselor												2									2
Grand Totals	110	15	201	74	79	58	92	58	34	19	142	118	29	16	16	19	76	89	65	24	1334

The licensure areas of principal (202), special education (193), and reading (186) had the highest numbers of program completers with previous certifications. School counselor and library media areas also had relatively high numbers. Many of the program completers with existing certifications were going into areas in which there were shortages, such as special education and reading. This may reflect a self-correcting mechanism within the market, in that many of these individuals may have had certifications in areas of oversupply and sought a second license in an area of undersupply.

The number of program completers with previous certification may be underreported. Only 202 of 285 individuals that completed principal programs were identified as holding previous certifications despite the prerequisite of previous certification in an educational licensure/subject area.

Table 5 shows annual program completer totals in the three broad fields of (1) elementary education, (2) secondary and specialized field, and (3) special education. These data indicate the number of elementary education completers increased by 280 (18%). The number of completers in secondary and specialized fields increased by 114 (6%). The number of special education completers decreased

Table 3
Program Completers with Previous Certifications, UW System

Activities	UW Eau Claire	UW Green Bay	UW La Crosse	UW Madison	UW Milwaukee	UW Oshkosh	UW Parkside	UW Platteville	UW Stevens Point	UW Stout	UW Superior	UW Superior	UW Whitewater	Totals UW System	Grand Totals
Superintendent				5	11							2		18	21
Director of Instruction				3	9							2		14	28
Pre-K through Grade 8		4	3		16	3	2	3		10				41	51
Agriculture															
Family and Consumer Ed.										1				1	2
Technology Education															
Business Education														0	1
Marketing Education															
Eng/Sp/Jour		1						1					1	3	5
Reading	10		41	8	5	36		6	3	17		2	15	143	186
Foreign Language	5		1		4	1	1			2				14	15
ESL		1	2		11	2				20				36	39
Math								1		1			1	3	4
Driver Education											32		6	38	38
Social Worker					1									1	1
Music - all areas					1			3						4	9
Principal				35	55							5		95	202
Physical Education										5				5	9
Art Education	1												1	2	3
Science	1	1			1			1		7				11	12
School Psychologist					4				7		13	1	4	29	29
Social Studies	1	1	1		1					3		1		8	11
Dir. Of Special Education				26	22							2		50	50
Cog/Emo/Lrng Dis.	15		36		55	33				42		5	7	193	193
Early Childhood:EEN	3		5			5								13	13
Speech/Lang Path										2				2	3
Library Media	7		4		45	3							3	62	62
Health Education										1			2	3	3
School Counselor			5		15	5		11			39	1	1	77	77
Totals	43	8	98	77	256	88	3	26	10	111	84	21	41	866	1067

by 60 (7%). The increase in elementary education program completers may indicate a plentiful supply in the immediate future of teachers in this area. Conversely, the decrease in special education will only exacerbate the shortage of special education teachers.

The number of program completers increased in several licensure/subject areas with undersupplies of teachers. Those included agriculture, family and consumer education, English as a Second Language, science, and director of special education. However, decreases occurred in other areas of undersupply such as reading, music, cognitive/learning/emotional disabilities, and speech and language. Areas with an abundance of teachers, elementary education and physical education, had increases in the number of program completers.

Attrition rates affect supply. School districts report data that show two types of attrition: (1) field attrition, which measures people who change fields within the teaching profession, such as switching from special education to general education, and (2) exit attrition, which measures people who leave the teaching field, usually due to retirement.

Table 4
Program Completers with Previous Certifications, Private Colleges

Activities	Alverno College	Beloit College	Cardinal Stritch	Carroll College	Carthage College	Concordia U	Edgewood College	Lakeland College	Lawrence U	Maranatha College	Marian College	Marquette	Mount Mary	Mt. Senario	Northland College	Ripon College	Silver Lake College	St. Norbert College	Viterbo College	WI Lutheran	Totals Private	
Superintendent												3										3
Director of Instruction	7									5	2											14
Pre-K through Grade 8	7			1						2												10
Agriculture																						
Family and Consumer Ed.													1									1
Technology Educ.																						
Business Education													1									1
Marketing Education																						
Eng/Sp/Jour	1					1																2
Reading					6	1						4							32			43
Foreign Language											1											1
ESL	1	2																				3
Math									1													1
Driver Education																						0
Social Worker																						0
Music - all areas	1									1	1		2									5
Principal	2					4					98	3										107
Physical Education	3				1																	4
Art Education									1													1
Science											1											1
School Psychologist																						0
Social Studies	1										1									1		3
Dir. Of Special Education																						0
Cog/Emo/Lrng Dis.																						0
Early Childhood:EEN																						0
Speech/Lang Path												1										1
Library Media																						0
Health Education																						0
School Counselor																						0
Totals	23	2		1	7	6			2	1	109	13	4						32	1		201

Field attrition (see Table 6) increased in general and special education from the 1997-98 to 1998-99 school year (see 1999 report for 1997-98 figures). Increases were from 6.3% to 8.06% in general education and 10.1% to 11.43% in special education. There were 235 transfers from special to general education while there were 136 transfers from general to special education. Thus, Wisconsin sustained a net loss of 99 special education teachers due to transfers between fields. Many of these transfers, however, were early childhood special educators that were teaching in inclusive kindergarten programs and transferred to general education.

Exit attrition, which includes individuals leaving the teaching field, increased in special education from 6.9% in 1997-98 to 8.2% in 1998-99 (see Tables 7 and 8). This is an unsettling trend in a field with chronic shortages. Much of the increase was due to a sharp jump from 7.0% to 9.4% in exit attrition rates in early childhood special education.

In general education, exit attrition rates increased from 6.3% in 1997-98 to 7.2% in 1998-1999. Interestingly, the number of transfers from general education into special education increased markedly in that period, from 82 to 136. Most of the increase was in elementary education, where the number of transfers to special education increased from 39 in 1997-1998 to 89 in 1998-1999. Transfers within general education also increased during that time period, from 643 to 746.

Table 5
Program Completers by Major Categories

	Elementary	Sec/Specialty	Special Educ.
1980-1981			861
1981-1982			826
1982-1983			780
1983-1984			919
1984-1985			738
1985-1986			733
1986-1987	2234	2070	765
1987-1988	2034	2308	678
1988-1989	2166	2250	707
1989-1990	2101	2333	742
1990-1991	2076	1966	505
1991-1992	1760	1709	530
1992-1993	1829	1754	718
1993-1994	1688	2121	709
1994-1995	1738	1939	793
1995-1996	1680	2134	857
1996-1997	1709	1891	752
1997-1998	1575	1938	863
1998-1999	1855	2052	803

Table 6

Field Attrition Rates 1990-1999

Field	90-91	91-92	92-93	93-94	94-95	95-96	96-97	97-98	98-99
General Ed.	4.80%	5.90%	7.80%	6.40%	11.50%	6.50%	7.50%	6.30%	8.06%
Special Ed.	6.80%	8.30%	14%	10.90%	14.60%	8.40%	11.80%	10.10%	11.43%

Table 7

State Exit Attrition Rates and Field Transfers for 1998-1999

Field	State Exit Attrition	Transfers to Special Ed	Transfers Within General Ed
Elementary	6.73%	89	356
Secondary	7.62%	47	390
Total General	7.18%	136	746

Table 8

Special Education Exit and Field Attrition for 1998-1999

Field	State Exit Attrition	Transfers to General Ed	Transfers Within Special Ed
E C Special. Ed	9.45%	35	8
C.D., L.D., EBD	6.95%	200	8
Total Special Ed.	8.20%	235	16

School District Survey Data

In October 1999, a survey was sent to all public school districts and Cooperative Education Service Agencies (CESA) in Wisconsin. The survey instrument sent to school district personnel reflected the authors' goal to collect valid and reliable supply and demand data. The following procedures were used to develop the survey instrument sent to Wisconsin school districts. First, the Educator Supply and Demand Rating Scale for School District Analysis Survey used in the 1997 study was examined and a decision was made to maintain the basic format. Second, several school district personnel were interviewed to identify validity and reliability issues. Third, a revised instrument was developed and feedback was solicited from school district personnel, DPI representatives, and faculty from institutions of higher learning. Fourth, final revisions were made and reviewed prior to mailing.

Based on the recommendations of school district personnel, DPI representatives, and higher education faculty, several modifications were made to the previous survey. One, definitions of critical terms were included. For example, vacancy was clearly defined for respondents and an illustration given. Two, step-by-step instructions were included with the survey materials. Three, examples of completed items were provided. Four, survey data could be submitted by mail, fax or electronically through a website.

Survey materials included three items. Items included: (1) cover letter, (2) instructions, and (3) survey form (See Appendix A). The survey consisted of two parts. Part one was the "Educator Supply and Demand Rating Scale for School District Analysis." Respondents reported the number of vacancies across licensure/subject areas and levels, the number of applicants per vacancy, and rate the supply of applicants. Part two requested information in the following areas: (1) emergency licensees, (2) personnel policies, (3) substitute teachers, and (4) miscellaneous.

A total of 443 surveys were sent in the first mailing. A second mailing followed with subsequent phone contacts made to districts that did not respond. Surveys from 395 Wisconsin school districts were returned (89%). Appendix B lists districts that provided survey data. Seventy-five percent of districts submitted data via mail, 11% via fax, and 14% via website. Survey data were not received from 49 districts (11%). The following section includes description and discussion of survey results.

Ratio of Applicants per Vacancy

One measure of teacher supply and demand is the ratio of applicants per vacancy. That is, the more applicants per vacancy the greater likelihood of oversupply. Conversely, fewer applicants per vacancy indicates a greater likelihood of undersupply. School districts listed the number of vacancies and applicants across licensure/subject areas for 1999-2000. The ratio was calculated by dividing the total number of vacancies reported by the total number of applicants across licensure/subject areas. Table 9 includes number of applicants, number of vacancies, and the ratio of applicants per vacancy across licensure/subject areas.

The range of applicants to vacancy ratio was 1.11 to 36.44. Visually and deaf/hearing impaired areas were the only ratios less than 2.00. Choosing 5.00 applicants per vacancy as a reasonable minimum ratio, there were 10 areas that fell below this cutoff. Four were special education related areas: visually impaired, deaf/hearing impaired, physical/occupational therapy, and emotional disabilities. Other teaching areas that fell below the minimum ratio were ESL/bilingual, family/consumer education, technology education, library/media, and physics.

Table 9
Ratio of Applicants to Vacancies for 1999-2000

Licensure/Subject Area	Total No. of Vacancies	Total No. of Applicants	Ratio of Applicants to Vacancies
Visually Impaired	9	10	1.11
Deaf/Hearing Impair.	27	41	1.52
Phys./Occupational Therapist	43	128	2.96
ESL/Bilingual	70	209	2.99
Family/Consumer Ed	67	262	3.91
School Nurse	14	55	3.93
Emotional Disabilities	233	947	4.06
Technology Ed	142	599	4.23
Library/ Media	85	378	4.47
Physics	25	114	4.56
Cognitive Disabilities	171	866	5.06
Reading Specialist	39	205	5.26
Business Ed	115	607	5.26
Early Child:EEN	55	302	5.49
School Psychologist	72	408	5.66
Director of Special Ed	18	104	5.94
Other (special fields)	81	490	6.02
Speech/Language Path	121	735	6.08
Learning Disabilities	300	1884	6.29
Reading Teacher	51	319	6.32
School Social Worker	22	140	6.36
Chemistry	54	360	6.67
Curriculum Director	35	288	8.23
Agriculture	30	244	8.24
Music	206	1876	9.10
Biology	61	553	9.10
Earth Science	46	470	10.22
School Counselor	138	1430	10.37
Art	126	1523	12.10
Journalism/Speech	20	249	12.45
Mathematics	271	3588	13.25
General Science	137	1835	13.38
Superintendent	35	481	13.74
High School Principal	60	1039	17.32
Elementary Principal	80	1485	18.68
English/Language Arts	318	6303	19.81
Middle School Principal	37	750	20.55
Phys. Ed	172	3744	21.83
Elementary	1247	34491	27.67
Early childhood/kinder	304	9016	29.71
Social Studies	205	7463	36.44

In contrast, using 15.00 as a reasonable maximum ratio of applicants to vacancy, there were eight areas that had ratios greater than the cutoff. Five were teaching and three were administrative areas. Teaching areas with the highest ratios were social studies (36.44), early childhood/kindergarten (29.71), elementary (27.67), physical education (21.83), and English/language arts (19.81).

Ratios of applicants to vacancies data must be viewed in light of several limitations. First, most, qualified individuals apply for more than one position, therefore, the number of applicants in a licensure/subject area is not equal to the number of individuals actively seeking employment in each area. For example, an individual that applied for five different elementary positions was counted five times. Second, it was assumed that individuals across different licensure/subject areas (e.g. elementary, science, special education, mathematics, etc.) apply for similar numbers of vacancies. Third, vacancies included both full-time and part-time positions.

Rating of Supply

Another measure of supply and demand is school district ratings of teacher supply. School district respondents rated the teacher supply for licensure/subject areas in which the district had at least one vacancy for 1999-2000. Ratings were based on the 5-point Likert scale below:

Extreme Shortage	Slight Shortage	Supply Normal to Demand	Slight Oversupply	Extreme Oversupply
1	2	3	4	5

An average rating was calculated by the sum of ratings for each area divided by the number of districts that submitted ratings. Table 10 includes a complete listing of average ratings across licensure/subject areas.

Using 2.44 as the cutoff, 35 licensure/subjects areas were rated as slight to extreme shortage, of which 11 were rated 1.45 and below (extreme shortage). Special education (11) and science (4) categories comprise approximately one third of the shortage areas. Cognitive disabilities and reading nearly fell within this range with ratios of 1.46. Three of the four lowest ratings were in special education areas. In addition to special education and science, other areas falling in the extreme shortage range included technology education, library/media, ESL/bilingual, family/consumer education, business education, and reading specialist.

In contrast, using 3.45 as the cutoff, only elementary was rated as an area of oversupply. The average rating of 3.77 indicates a slight oversupply. Two other areas were rated above 3.00. These were physical education and social studies with average ratings of 3.24 and 3.43, respectively.

The measures, ratio of applicants per vacancy and district ratings of teacher supply, produced similar results. Correlation between the two measures was .80. Shortages were identified in specific special education categories, technology education, ESL/bilingual, physics, family/consumer education, and library/media. Oversupply was indicated in elementary, social studies, physical education, early childhood/kindergarten, and English/language arts.

Program Completer to New Hire Ratio

A third indicator of demand within teaching certifications was the ratio of program completers to new hires in Wisconsin public schools. See Table 11 for these data. Program completer data were taken from Wisconsin teacher training institution reports submitted to the Department of Public Instruction. New hire totals were based on data school districts submit annually to the DPI covering new hires and their certification areas. These totals did not include program completers who took new positions outside their field nor those employed by private schools or out of state.

Table 10
Average Supply Rating Across Licensure/Subject Area

<u>Licensure/Subject Area</u>	<u>Average Supply Rating</u>
Deaf/Hearing Impair.	1.07
Visually Impaired	1.14
Technology Ed	1.17
Emotional Disabilities	1.23
Library/ Media	1.25
ESL/Bilingual	1.27
Physics	1.33
Family/Consumer Ed	1.33
Business Education	1.39
Reading Specialist	1.44
Chemistry	1.45
Cognitive Disabilities	1.46
Reading Teacher	1.46
Curriculum Director	1.56
Director of Special Ed	1.60
Speech/Language Path	1.60
School Social Worker	1.61
Agriculture	1.62
Learning Disabilities	1.68
Biology	1.73
Early Childhood:EEN	1.73
School Psychologist	1.77
Music	1.80
Mathematics	1.86
Phys./Occupational Therapy	1.88
Earth Science	1.94
Superintendent	1.98
Art	2.01
High School Principal	2.03
General Science	2.10
School Counselor	2.16
Journalism/Speech	2.17
School Nurse	2.18
Elementary Principal	2.26
Middle School Principal	2.30
English/Language Arts	2.46
Early childhood/kinder	2.80
Phys. Ed	3.24
Social Studies	3.43
Elementary	3.77

Table 11
Ratio of Program Completers to New Hires Across Fields

Category	Program completers	New hires in field	Ratio
Business Education	23	11	0.48
Technology Educ	48	20	0.42
Music	108	41	0.38
Math	144	41	0.28
Pre-K through 8	1855	521	0.28
Physical Ed./Health	200	55	0.28
Family and Con Ed.	47	12	0.26
Science	218	52	0.24
Cog/Lrng/Emot Dis,	599	142	0.24
Eng/Sp/Jour	229	51	0.22
Early Childhood:EEN	77	17	0.22
Art Education	128	28	0.22
Agriculture	40	8	0.20
ESL	48	9	0.19
Foreign Language	142	25	0.18
Social Studies	305	48	0.16
Grand Totals	179	72	0.40

The program completers to new hires ratio showed results fairly consistent with other demand indicators. Business education and technology education have consistently been rated as high-demand fields, while social studies consistently ranked among the lowest in demand. Special education categories were combined for this measure, because of changes in reporting methods that group those three special education areas in the same category. English as a Second Language had a low program completers to new hires ratio, but many teachers with ESL certification are hired as elementary school teachers and thus do not appear as a new hire in field.

Emergency Licensees

Emergency Licensees

Wisconsin's Department of Public Instruction issues emergency licenses to ease critical shortages in a number of educational fields. School districts request emergency licenses for individuals from DPI. Two types of emergency licenses are issued. One type, permits, are issued for individuals with a bachelor's degree and no teaching license. For example, a district may request that an individual with a bachelor of arts degree in sociology be permitted to teach social studies. The other type, special licenses, are issued for individuals with a bachelor's degree and license in another field. For example, a district may request an individual with a bachelor of science degree in Spanish and license to teach Spanish at the secondary level be permitted to teach elementary education.

School districts hire emergency licensees when a licensed candidate is not available or when extenuating circumstances justify it. The number of emergency licensees hired by school districts across licensure/subject areas provides additional data to identify areas of personnel shortages. It is reasonable to assume that high numbers of emergency licenses in given subject/licensure areas are indicative of shortages of qualified personnel.

One portion of the comprehensive survey sent to all Wisconsin public school districts and CESA's included questions regarding hiring of individuals with emergency licenses. This emergency licensee section includes the following: (1) vacancies filled by emergency licensees and (2) emergency licenses issued by DPI.

Table 12
Frequency Distribution of 1999 - 2000 Vacancies Filled by Emergency Licensees

<u>No. of Vacancies</u>	<u>No. of Districts</u>
0	146
0.5	6
1	105
1.5	1
2	58
2.5	1
3	25
4	17
5	3
6	2
7	1
16	1
25	2
26	1
43	1
98	1

Vacancies Filled by Emergency Licensees

Of 395 Wisconsin school districts responding to our survey, 371 reported the number of 1999-2000 vacancies filled by individuals with emergency licenses (See Table 12). Emergency licensees were hired for approximately 638 vacancies. Nearly two-thirds of responding school districts (61%) reported hiring emergency licensees for 1999-2000 vacancies. The number of vacancies filled by emergency licensees across school districts ranged from .4 to 98 vacancies. Almost half of school districts that hired emergency licensees filled a single full-time or part-time vacancy, whereas, approximately three-fourths of districts hired emergency licensees for 2 vacancies or less, and 96% of the districts hired emergency licensees to fill five vacancies or less. Nine school districts reported hiring emergency licensees for more than 5 vacancies for the 1999-2000 school year.

Although responding school districts reported a total of 638 vacancies filled in 1999-2000 by emergency licensees, some districts did not provide complete descriptive information regarding licensure/subject areas. Table 13 provides a comparison of vacancies filled by emergency licensees across licensure/subject areas for 1999-2000. Data for the 20 most frequently reported licensure/subject areas are included.

Special education vacancies accounted for approximately one third of all 1999-2000 vacancies filled by emergency licensees. Within special education, emotional disorders and learning disabilities positions accounted for approximately 44% and 23% of special education emergency licensees respectively.

A second tier of subject/licensure areas filled by emergency licensees included mathematics, science, reading, technology education, and agriculture. Between 22.5 and 31 vacancies were filled by newly hired emergency licensees in each of these areas. Relatively high frequencies were reported in the areas of instruction/library/media, administration, foreign language, business education, elementary and ESL.

Emergency Licenses Issued by DPI

Wisconsin's Department of Public Instruction issued a total of 2,091 emergency licenses in 1999-2000. This total includes licenses issued to individuals for the first time in 1999-2000 school year and emergency license renewals. Table 14 provides the number of emergency licenses issued for the 20 licensure/subject areas with the highest totals.

As shown in the table below, 905 emergency licenses (43%) were issued for special education. Emergency licenses for emotional disorders and learning disabilities were issued more frequently than for any other specific licensure/subject area. The number of emergency licenses issued in cognitive disabilities was exceeded only by emergency licenses for reading with 126 and 136 respectively. Emergency licenses issued to prospective ESL teachers also exceeded 100 during the 1999-2000 school year. Other subject/licensure areas in which comparatively high numbers of emergency licenses were issued included bilingual education, science, foreign language, mathematics, and technology education.

Table 13
Emergency Licensees Hired to Fill 1999-2000
Vacancies Across Licensure/Subject Areas

Licensure/Subject Area	No. Hired
Special Education	146
Audiologist	1
Deaf/Hearing Impair.	1
Physical Therapist	1
Visually Impaired	1
Early Child: EEN	2
Director of Special Ed	2
Occupational Therapist	2
Speech/Language Path	3
Adaptive Phys. Ed	5
Cognitive Disabilities	11
Cross Categorical	19
Learning Disabilities	34
Emotional Disabilities	64
Mathematics/Computer Science	31
Science	28.5
Reading	24
Tech Education	23
Agriculture	22.5
Instruction/Library/Media	19
Administration	18
Foreign Language	16
Business Education	15
Elementary	14
English as Second Language	14
Physical Education	13.5
Music	13
Guidance	12
English/Journalism/Speech/Theatre	10
Social Studies	10
Family and Consumer Ed	8
Early Childhood/Pre Kindergarten	7
Kindergarten	7

Table 14
Emergency Licenses Issued in Wisconsin for 1999-2000

Licensure/Subject Area	99-00
Special Education	905
Reading	136
Elementary	132*
English as Second Language	102
Bilingual Education	86
Science	84
Foreign Language	78
Tech Education	69
Mathematics/ Computer Science	69
English/ Journalism/ Speech/Theater	64
Instruction/ Library/ Media	64
Guidance	57
Music (K-12)	56
Business Education	36
Social Studies	35
Driver/Safety Education	28
Health	22
Physical Education	18
Family/Consumer Education	15
Agriculture	11

* Includes foreign language immersion, Montessori, inclusive kindergartens, and at least 60 licenses for bilingual elementary education programs
 Source: Teacher Licensing Team, Wisconsin Department of Public Instruction, 2000.

School districts generally hired emergency licensees as intended, that is, as a limited approach to filling serious personnel needs. This is suggested by the fact that over one third of reporting school districts hired no emergency licensees to fill 1999-2000 vacancies and three fourths of reporting school districts hired no more than 2 emergency licensees. Only 4% of responding districts reported hiring more than 5 emergency licensees.

In summary, emergency licensee data reported by school districts suggest Wisconsin has serious shortages of licensed teachers in a number of areas. Responding districts hired a total of 638 emergency licensees to fill 1999-2000 vacancies. Analysis of these data indicates a severe personnel shortage in special education, especially in the categorical areas of emotional disorders, learning disabilities, and cognitive disabilities. Other areas included mathematics, science, reading, technology education, and agriculture.

Emergency license data provided by Wisconsin's Department of Public Instruction further substantiate the existence of teacher shortages in a number of areas. The breakdown of all emergency licenses issued by DPI for 1999-2000 pinpoints a severe shortage of special education teachers. Emergency licenses issued in emotional disorders and learning disabilities surpassed all other areas. Reading, cognitive disabilities, ESL, science, foreign language, technology education, mathematics, and several other areas had relatively high numbers of emergency licenses issued.

Hiring of emergency licensees and issuance of emergency licenses data offer an opportunity to identify personnel shortages in Wisconsin schools. However, a number of related issues should be investigated. First, there is continued need for teacher training institutions to investigate innovative methods to recruit, retain, and graduate students across licensure/subject areas in which shortages exist. Second, there is a need for state departments of education to explore development of licensure reciprocity agreements across states. Third, there is a need for school districts to examine innovative hiring practices that may include early signing of preservice teachers and sharing of personnel. In essence, it is important not only to identify shortages but also to identify effective methods to alleviate these shortages. Fourth, a survey of emergency licensees may provide insights into alleviating the situation and improving the licensing process.

An adequate supply of substitute teachers is critical for local school districts. Substitute teachers maintain daily programming for students for absent classroom teachers. Teachers are unavailable for a variety of reasons including the following: (1) sick leave, (2) inservice training, (3) IEP meeting and (4) personal leave.

In recent years, Wisconsin school districts have faced a serious shortage of qualified substitute teachers. In 1996, DPI enacted the Substitute Permit Rule PI 3.03(8)(b). This legislation reflected recommendations offered by a specially appointed task force appointed to examine a chronic and serious shortage of licensed substitute teachers. The permit rule provided individuals with non-teaching degrees an opportunity to obtain a 3-year permit to substitute teach in Wisconsin public schools, thereby increasing the number of eligible candidates. Today, efforts continue at the state and local levels to alleviate the shortage of substitutes.

Items related to substitute teacher supply and demand were included as part of the comprehensive supply and demand survey sent to all public school districts in Wisconsin. This section includes the following: (1) ratings of overall supply of substitute teachers, (2) utilization of individuals with substitute teacher permits, and (3) efforts to increase substitute teacher pool.

Substitute Teachers

Ratings of Overall Supply of Substitute Teachers

Respondents were asked to rate the overall supply of substitute teachers in their district on the following 5-point Likert scale:

Extreme Shortage	Slight Shortage	Supply Normal to Demand	Slight Oversupply	Extreme Oversupply
1	2	3	4	5

Analysis of the survey responses revealed an undersupply of substitute teachers (See Table 15). Of 380 responding school districts fully 358 (94%) reported a shortage in the overall supply. Specifically, 225 (59%) school districts rated their supply of substitute teachers in their districts as an “extreme shortage” and 133 (35%) rated the overall supply as a “slight shortage.” Just 17 (4%) respondents indicated a supply “equal to demand”, whereas, one school district reported a “slight oversupply” of substitute teachers. The average rating equalled 1.5 (between a “slight and an extreme shortage”) for all responding districts. These data clearly reflect the seriousness of the situation. Availability of substitute teachers continues to be a major problem for most school districts, and a vexing concern for over half.

Table 15
School District Ratings of Substitute Teacher Supply

Rating	No. of Districts
1-Extreme Shortage	225
2-Slight Shortage	133
3-Supply Normal to Demand	17
4-Slight Oversupply	1
5-Extreme Oversupply	0
No Rating Provided	11
Between 1 and 2	4

Individuals with Substitute Teacher Permits

As stated previously, Wisconsin’s Department of Public Instruction initially awarded Substitute Teacher Permits in 1996 to individuals with non-teaching four-year degrees. It was expected that the addition of non-licensed college graduates to the substitute teacher pool would alleviate shortages. Most school districts, however, continue to report an undersupply of substitute teachers.

Clearly, school districts benefit from Wisconsin’s Substitute Teacher Permit regulation. A majority of school districts reported employing individuals with Substitute Teacher Permits (See Table 16). Approximately three-fourths (74%) of responding school districts reported they regularly or occasionally relied on individuals with non-teaching degrees as substitute teachers, while approximately one fourth (25%) of respondents reported rarely or never employing these individuals as substitute teachers. Only three (1%) respondents reported that the question was not applicable. Based on the reported widespread use of individuals holding permits, the decision to issue Substitute Teacher Permits partially alleviated the shortage of substitutes available to some school districts. Nevertheless, a significant shortage of substitute teachers continues to plague districts as reported above.

Table 16
School District Use of Individuals with Substitute Teacher Permits

Frequency of Use	No. of Districts
1-Never	21
2-Rarely	74
3-Occasionally	125
4-Regularly	154
No Rating Provided	18
NA	3
Total No. Responses	395

Efforts to Increase Substitute Teacher Pool

School districts reported an array of strategies to increase the number of individuals in the substitute teacher pool. See Table 17 for a listing of the four most frequently cited strategies.

Table 17
School District Strategies to Increase Pool of Substitute Teachers

Strategy	Percentage of School Districts Reporting Use
Advertisements/Recruitment	52%
Monetary Incentives	45%
Training	5%
Improve Working Conditions	1%

Over half (52%) of respondents cited advertising as a strategy to increase the available pool of substitute teachers. Advertising media mentioned in responses are listed below:

- television* *radio* *newspaper*
- internet* *newsletter* *bulletin board posting*
- job fairs* *direct mailing* *telephone*

Districts frequently reported recruitment of specific populations to increase the pool of substitute teachers. Districts located near universities frequently described efforts to recruit graduate students through campus posters and mailings. One district reportedly recruited spouses of personnel at a nearby military installation. Another district surveyed parents to identify those with bachelor degrees and the potential to obtain a substitute teacher permit. Retirees were also recruited as substitutes by several districts. In addition, districts reported a variety of other strategies to recruit substitute teachers such as: (1) substitute teacher information and applications were attached to all materials requested from the district, (2) substitute teacher lists were shared with other districts, and (3) recruitment fairs were organized.

Many school districts (24%) offered financial incentives to attract more substitute teachers. Some reported a recent increase in per diem rates for substitutes. Twenty-nine school districts provided specific per diem rates with a reported range between \$70 and \$105. The average per diem rate was \$88. In addition, other districts reported increases in per diem rates based on the number of days an

individual substituted in the district. For example, one district reported incremental increases in per diem rate when an individual substituted in the district 10, 20, and 30 days. A few districts paid higher per diem rates to individuals that agreed not to accept an assignment in another district before a specified time of day. For example, one district offered an additional \$10 per day to individuals that agreed not to accept a substitute position with another district until after 6:30 a.m. Other financial incentives included free lunches, gifts, and mileage reimbursements. Several districts offered long-term substitutes increased per diem rates and benefits.

Training was mentioned by 5% of the responding districts as a method to increase their pools of substitute teachers. Some districts offered on-site training for individuals to earn their Substitute Teacher Permit. A few paid the costs of training and/or a stipend for individuals that pursued a permit. Other districts invited substitutes to all district inservice trainings, while a few provided training to meet specific needs of substitute teachers.

Less frequently mentioned as a strategy to attract substitutes was improvement of working conditions (1%). Districts provided an array of responses in this category. Methods to improve working conditions for substitute teachers are listed below. Efforts were made to address professional and personal needs of substitutes. Some districts noted the importance of a comfortable work environment for substitute teachers.

District Methods to Improve Working Conditions

- Principal provided regular feedback to substitute teachers
- District surveyed needs of substitutes
- Principal checked on substitutes during the workday
- Principal welcomed substitutes upon arrival
- Teachers provided quality lesson plans
- Substitutes assigned to preferred grade when possible
- Substitutes contacted a day before when possible
- Substitutes paid to shadow teachers for a day
- Staff and students encouraged to treat substitutes well
- District sent holiday cards and/or gifts to substitutes
- District invited substitutes to staff social events

A variety of other strategies were reported that did not fit into the three categories listed above. Strategies included the following: (1) reimbursements to classroom teachers to cover classes for colleagues, (2) utilization of private agencies to develop substitute teacher pools, and (3) efforts to enlist part-time staff members as substitute teachers.

In addition, it would be remiss to omit the fact that a number of responses included simply “beg” and/or “prayed” as strategies to address shortages. These facetious responses occurred with such frequency that they underscored the frustration felt by personnel responsible for hiring substitute teachers on a daily basis.

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In summary, school districts use a range of strategies to increase the number of available substitute teachers. They frequently advertise using a variety of media formats. Numerous districts report efforts to recruit potential substitutes from specific populations. In addition, survey responses indicate districts use increased per diem rates, incremental increases in per diem rate based on number of days employed, mileage reimbursement, and free lunch as strategies to increase the number of available substitutes. Many districts also exerted efforts to increase the number of individuals that complete substitute teacher permit training. In sum, districts have devoted significant attention and resources to increase the number of available substitute teachers yet continue to find a chronic and serious undersupply.

Future investigations should examine why nearly one fourth of school districts reported never or rarely using the substitute teacher permit option. Do these districts possess an adequate supply of licensed individuals? Is there an insufficient number of individuals seeking and obtaining this credential in these districts? Is there an insufficient number of training programs available to train individuals who are interested in seeking a permit? Are school districts reluctant to employ these individuals with permits because they are not trained teachers? Answers to such questions may provide direction for future study.

In addition, prior to commitment of substantial resources to recruitment and training of more individuals in substitute teacher permit programs several questions should be investigated. For example, how many days per year do individuals with substitute teacher permits work in the schools? How many years do these individuals make themselves available to substitute? Is this a cost-effective method to address substitute shortages?

Few districts have examined methods to improve working conditions for substitute teachers. A comprehensive and systematic assessment of substitute needs and job satisfaction could provide important insights that would result in increased supply of individuals willing to substitute.

Many Wisconsin school districts implemented plans to increase the supply of substitute teachers. School district data, however, document a serious shortage of substitute teachers and indicate that additional avenues must be explored. One avenue is to explore ways to reduce the demand for substitute teachers. This may include exploration of greater cooperation among school districts to share substitutes with each other, to schedule inservice and conference days, and to provide regional training sessions.

Some districts reportedly utilized existing staff in lieu of substitute teachers. For example, an increasing number of districts hired full-time personnel to be used as substitutes. Other districts stated they reimbursed classroom teachers when they covered for colleagues, while other districts used part-time personnel. More districts could consider using in-house personnel as substitute teachers to limit the demand for substitutes from a competitive marketplace.

Additional investigations could examine methods to reduce the frequency of teacher absenteeism. Investigations of the effects of health promotion programs, innovative scheduling, extended school year, and co-teaching structures could be thoughtfully examined. Obviously, such approaches would have implications for school budgets and contractual agreements between school districts and teacher unions.

Program Completers Survey

A survey of program completers from Wisconsin training institutions was included in this year's project. The purpose of this component was to obtain a more complete picture of career paths followed by this population and to better understand supply and demand dynamics. Survey questions probed a variety of topics such as: (1) teaching certifications, (2) present job status, and (3) job location. See Appendix C for a copy of the cover letter and survey.

Criteria for participation included the following: (1) completed licensing program between December 1998 and August 1999 and (2) completed program at a four-year institution in the University of Wisconsin System. A random sample of 10% (235) of eligible participants was surveyed. When necessary, follow-up requests for participation included a second mailing and three phone contacts. See Table 18 for program completer survey data.

A total of 186 individuals (79% return) participated. Results indicated that 144 (77%) program completers were full-time teachers in public or private schools in Wisconsin or out-of-state, 14 (8%) were part-time teachers, and 18 (10%) were substitute teachers. Ten (5%) were non-teachers. Most full-time teachers (94%) taught in public schools. The remaining 6% taught in private schools. Of those teaching full-time, 122 (85%) were employed in Wisconsin while 22 (15%) reported working in other states.

Table 18
Wisconsin Program Completer Status

	Full-time Public In-State	Full-time Private In-State	Full-time Teaching Out of State	Part-time	Not Teaching	Substitute
Elementary	55	6	12	7	4	11
Secondary	22	2	7	2	3	4
Special ed.	17	1	1	3	1	0
Dual	5	0	0	0	0	0
Specialized K-12	14	0	2	2	2	3
Total	113	9	22	14	10	18
	61%	5%	12%	8%	5%	10%

All certification areas showed high employment rates, however, 61% of substitute teachers and 40% of non-teachers completed elementary programs. In comparison, 22% of substitute teachers and 30% of non-teachers completed secondary programs. No special education program completer reported substituting, while 10% of non-teachers completed special education programs.

Despite an excellent return rate of 79%, consideration should be given to one particular limitation in these data. That is, a “volunteer effect” can be expected with this type of survey. Meaning, those not teaching nor substitute teaching may have been less likely to respond, and therefore, results in these categories may be slightly depressed. Similarly, individuals working out of state may have been less likely to respond.

There are significant similarities between findings of this investigation and a University of Wisconsin System study released in September 1999. The UW system survey of program completers found 73% of respondents were full-time teachers, 4% part-time teachers, and 9% substitute teachers. Comparable results also were reported in that 78% of program completers that were teachers reported working in Wisconsin and 22% out-of-state.

Data from this supply and demand project supports earlier conclusions of the UW system study. Combined data from the two studies indicate recent program completers of teaching programs in the University of Wisconsin System are likely to be employed as full-time teachers in a Wisconsin public school.

Data collected through tracking participants in this year’s survey and future program completers can provide essential information regarding supply and demand processes, trends, and solutions. It is recommended that such a longitudinal study be conducted as part of future reports.

National Supply and Demand Data

A survey of states' supply and demand reports was an added component to this year's project. There were two purposes for this addition. One purpose was to compare Wisconsin supply and demand data with other states. The second was to improve methods for data collection, analyses, and dissemination. This section will include brief descriptions and analyses of results.

Departments of education from all 50 states and the District of Columbia were contacted requesting information, materials, and publications related to educational personnel supply and demand research. Contacts were made using the following methods: (1) email, (2) letter, and (3) phone. Materials were obtained from 33 states (65%). Seventeen states (35%) reported supply and demand information was unavailable at this time.

A comparison of data across states is challenging for three reasons. First, measures were variable across state reports. Second, definitions, variables, and analyses lacked uniformity. Third, there were substantial differences across license/subject area categories. Given the aforementioned challenges, comparisons of data across states provide valuable trend information.

There are several areas of undersupply frequently reported across states. Shortages were most frequently mentioned for special education, science, technology education, foreign language, counseling, ESL, and music. More than half the states had shortages in special education and mathematics. Approximately one-third reported an undersupply of science teachers. Special education areas most frequently cited were emotional-behavioral disorders, speech and language, hearing impaired, learning disabilities, and visually impaired. Shortages in science included physics, chemistry, and physical science. Spanish was the most common foreign language shortage. Table 19 includes a distribution of most frequently reported shortages described in state reports.

Table 19
Teacher Shortage Reported by 33 States

Subject/License Area	No. of States Reporting Shortage
Special Education	19
Math	17
Science	10
Technology Education	9
Foreign Language	8
Counseling	7
ESL	6
Music	6

Oversupply of teachers was most frequently reported in 3 areas. These areas included: (1) elementary, (2) physical education, and (3) social studies. Approximately 10% of states reported an oversupply in these areas.

Supply and demand findings were similar for Wisconsin and other states. For example, analyses of Wisconsin data indicated various degrees of undersupply in special education, mathematics, science, technology education, foreign language, counseling, ESL, and music. Likewise, an abundance of teachers was indicated in elementary, physical education, and social studies.

National figures further support the aforementioned findings. U.S. Department of Education reports from 1993 indicate an abundance of teachers in elementary and physical education as well as

shortages in special education and several secondary licensure/subject areas. Boe (1999) reported surpluses in general elementary education and physical education/health. The report estimated a net supply of general elementary teachers of approximately 63,000 graduates in 1993, while vacancies in public and private schools was estimated to be 51,000. Thus, a surplus of more than 12,000 graduates was estimated. Similarly, an estimate of 16,500 graduates and 8,900 openings in physical/health education indicated an oversupply of 7,600. In contrast, Boe reported shortages in secondary fields. Approximately 24,000 graduates were estimated in these fields and 68,000 openings for a shortfall of 44,000 teachers. In special education, the shortfall was estimated to be 3,500 teachers, with 11,800 graduates and 15,300 openings.

National shortages in special education are expected to worsen. Another U.S. Department of Education study (Boe, 1998) cited a chronic annual shortage of 29,000 special education teachers nationwide. Several factors contribute to this chronic shortage. First, a significant percentage of special education teachers transfer to general education annually (5.1%). Second, the attrition rate of special education teachers is 7.9%. These percentages mirror Wisconsin's attrition rate of 8.2% for special education teachers.

In conclusion, national and Wisconsin teacher shortages in specific licensure/subject areas are serious and chronic. In particular, serious shortages exist in special education and are likely to continue. An abundance of teachers in elementary general education and physical/health was noted in national reports, as well as, in measures used in this report.

Format and Content of State Reports

Supply and demand data primarily were available through state publications or websites. See Table 20 for a description of state reports. Twenty-two (67%) published booklets, whereas seven (21%) states used websites to report data. Four states (12%) provided data upon request or through a newsletter format. The average booklet contained 29 pages with a range from 12 to 115.

Content of supply and demand reports was variable. Content information was compiled following analyses of tables of content and cursory examination of materials. Over half (55%) of the reports included demographic analyses that provided supply and demand data for state geographic units such as districts, counties, and/or regions. Similarly, 52% included data on racial, cultural, or ethnic composition of the teacher workforce. Fifteen reports (46%) provided higher education data such as number of graduates from specific institutions, number of graduates across subject/field areas, and placement rates of graduates. Emergency licensee data were included in 14 reports (42%). Approximately one third included teacher salary information and data collection instruments.

Variables and formulae for computing supply and demand were varied and complex. Lack of standardized practices for data collection, analysis, and reporting is problematic and hinders efforts to identify and address national educational personnel issues. Initial efforts are underway through North Central Regional Educational Laboratory to develop uniform data collection and analyses methods at the regional level. Such efforts are important if there is to be a concerted approach to resolve national and regional supply and demand problems.

In summary, considerable effort was made to contact knowledgeable individuals in departments of education to obtain pertinent information. Only 33 states provided these materials. Reports varied in format and length. Likewise, there was considerable variation in the types of data included in supply and demand reports. Although aforementioned variations make comparisons across states tenuous, areas of teacher undersupply and surplus were similar for Wisconsin and many other states.

Table 20
Format and Content of State Reports

* report was not available for analysis or individual responsible for report could not be contacted
Format: B=Booklet, W=Website, O=Other

	Format	Number of Pages	Higher Education	Emergency License	Salary	Minority	Demographic Analysis	Sample Instruments	Year of Publication
Alabama	*								
Alaska	B	23	X		X	X	X	X	1999
Arizona	W				X				1999
Arkansas									
California	W			X		X	X		1998
Colorado	*								
Connecticut	W					X			1999
Delaware	B	18			X		X		1998
Florida	W		X		X	X			2000
Georgia	W		X	X					1997
Hawaii	*								
Idaho	B	28	X	X	X	X		X	1999
Illinois	B	40					X		1999
Indiana	B	30	X	X	X				1999
Iowa	L	2							1999
Kansas	B	66	X				X		1999
Kentucky	B	71	X		X	X			1996
Louisiana	*								
Maine	*								
Maryland	B	56	X			X			1999
Massachusetts	O	4						X	1998
Michigan	*								
Minnesota	B	64				X			1999
Mississippi	B	33					X	X	1997
Missouri	B	68	X	X		X	X		2000
Montana	*								
Nebraska	*								
Nevada	*								
New Hampshire	B	54				X	X		1999
New Jersey	*								
New Mexico	*								
New York	W			X	X		X		1998
North Carolina	W			X	X	X	X	X	1998
North Dakota	B	40					X	X	1999
Ohio	B	20		X	X	X			1999
Oklahoma	B	12	X	X		X	X		1998
Oregon	B	17				X	X		1999
Pennsylvania	B	50	X	X	X	X		X	1999
Rhode Island	*								
South Carolina	O	1				X			1999
South Dakota	*								
Tennessee	B	15		X			X		1999
Texas	B	53	X	X			X	X	1999
Utah	O	8						X	1999
Vermont	*								
Virginia	B	20	X			X		X	1999
Washington	*								
West Virginia	B	115	X	X	X		X		1998
Wisconsin	B	56	X	X			X		1999
Wyoming	*								
Other:									
Washington D.C.*									
TOTAL			15	14	12	17	18	10	

Employment Outlook Across Selected License/Subject Areas

The following section includes ratings of employment outlook across selected license/subject areas. Outlooks were based on ratings of supply provided by Wisconsin school districts. Rating of supply was chosen as the determinant of outlook for three reasons. One, the correlation between ratings of supply and ratio of applicants to vacancies was .80. Two, ratings of supply may be a more precise measure of demand because the ratio of applicants to vacancies may inflate the supply of available teachers because individuals frequently apply to more than one vacancy. Three, this measure provides a quantitative approach to rating employment outlooks. Furthermore, additional data are included near the end of this section to enable readers to generate their own assessment of outlooks for employment across areas.

Outlooks were determined using the following procedure. First, the overall mean of supply ratings was calculated (1.85). Second, the standard deviation was calculated for the data set (.6). Third, an initial interval of .5 standard deviation above and below the mean was established. Supply ratings within this interval were rated as ‘average employment outlook.’ Additional intervals were established in 1 standard deviation increments and assigned an employment outlook category. Fourth, supply ratings for licensure/subject areas were categorized. Table 21 is a listing of categories, criteria, and licensure/subject area.

Table 21
Catagories and Criteria for Employment Outlook

Category	Criteria	Licensure/Subject Areas
Well Above Average	Below 1.25	deaf/hearing impairment, visually impaired, technology education, emotional disabilities
Above Average	1.25 to 1.54	library/media, ESL/bilingual, other (special fields), physics, family/consumer education, other (special education), business education, reading specialist, chemistry, cognitive disabilities, and reading teacher
Average	1.55 to 2.15	curriculum director, director of special education, speech/language pathologist, school social worker, agriculture, other (MS/HS), learning disabilities, biology, early childhood:EEN, other (specialized), school, psychologist, music, mathematics, PT/OT, earth science, superintendent, art, high school principal, and general science
Below Average	2.16 to 2.45	school counselor, journalism/ speech, school nurse, elementary principal, middle school principal, other (elementary), and other (administration)
Well Below Average	Above 2.45	English/language arts, early childhood/kindergarten, physical education, social studies, elementary

There is ample reason for disagreement in determination of the best method to judge employment outlook across licensure/subject areas. Table 22 includes a summary of data that may assist the reader in formulating employment outlooks using different measures. Data from the following measures are included: (1) rating of supply as indicated by school districts, (2) ratio of applicants per

vacancy, and (3) ratio of program completers to new hires in field and (4) number of new emergency hires as reported by school districts in the mailed survey. In general, supply and demand inferences for license/subject areas were consistent across the data sets. New hire data was not available for all certification areas.

Table 22
Summary of Supply and Demand Statistics

Certification	Rating of Supply	Ratio of Applicants to Vacancies	Program Completer to New Hire in	New Emergency Hires
Deaf/Hearing Impair.	1.1	1.5		2
Visually Impaired	1.1	1		1
Technology Ed	1.2	4.2	.42	26.5
Emotional Disabilities	1.2	4		64
Library/ Media	1.3	4.5		19
ESL/Bilingual	1.3	3	.19	14
Other (special fields)	1.3	6		
Physics	1.3	4.6		5
Family/Consumer Ed	1.3	3.9	.26	8
Other (special ed.)	1.4	4		19
Business Ed	1.4	5.2	.48	13
Reading Specialist	1.4	5.3		4.5
Chemistry	1.4	6.7		6.5
Cognitive Disabilities	1.5	4.9		11
Reading Teacher	1.5	6.2		15.5
Curriculum Director	1.6	8.2		1
Director of Special Ed	1.6	5.9		2
Speech/Language Path	1.6	6		3
School Social Worker	1.6	6.3		1
Agriculture	1.6	8.2	.20	21.5
Other (MS/HS)	1.7	3.2		
Learning Disabilities	1.7	6.2		34
Biology	1.7	9.1		
Early Child:EEN	1.7	5.5	.22	2
Other (specialized)	1.7	36.3		
School Psychologist	1.8	5.6		1
Music	1.8	9.1	.38	17
Mathematics	1.9	13.2	.28	14
PT/OT	1.9	3		3
Earth Science	1.9	10.2		4
Superintendent	2	13.7		
Art	2	12	.22	2
High School Principal	2	16.8		
General Science	2.1	13.3	.24	13
School Counselor	2.2	10.4		12
Journalism/Speech	2.2	12.5		2
School Nurse	2.2	3.9		
Elementary Principal	2.3	18.7		
Middle School Principal	2.3	20.5		
Other (elementary)	2.3	52.8		
Other (administration)	2.4	9		18
English/Language Arts	2.5	19.8	.22	7
Early childhood/kinder	2.8	29.2		14
Phys. Ed	3.2	21.8	.28	13.5
Social Studies	3.4	36.4	.16	9.5
Elementary	3.8	27.6	.28	14

The following section includes projected regional employment opportunities in Wisconsin across select license/subject areas. Licensure/subject areas were selected if they included the greatest number of program completers and were categorized as extreme shortage or oversupply areas. Selected areas include: (1) elementary education, (2) major secondary fields, and (3) special education. Job outlooks for 46 license/subject areas are provided at the Department of Public Instruction website.

For each selected area a general outlook statement is provided followed by supporting information. In addition, maps are displayed with a regional rating of employment opportunities.

Shading is based on the scale described earlier, with lighter shading for below average job outlooks and darker shading for above average outlooks. The scale used, based on school district supply ratings, placed job outlooks in these five categories: (1) Well above average, below 1.25 rating, (2) Above average, 1.25 to 1.54, (3) Average, 1.55 to 2.15, (4) Below average, 2.16 to 2.45, and (5) Well below average, Above 2.45.

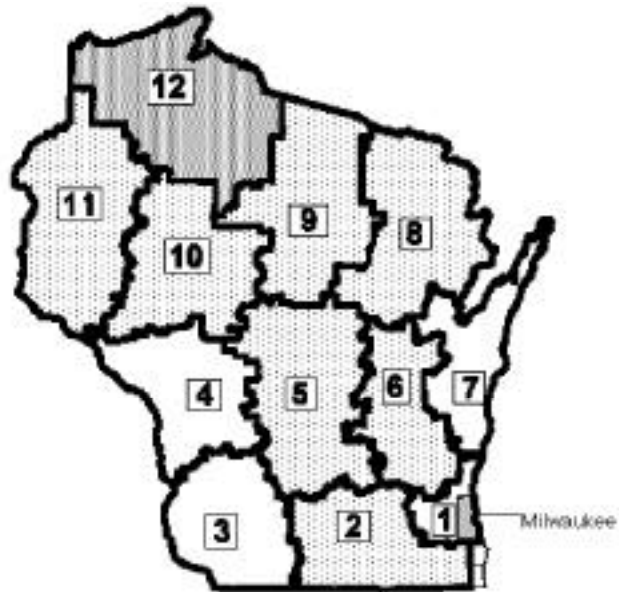
Employment Outlook by Subject Field

Elementary education

Elementary

Outlook: Well below average

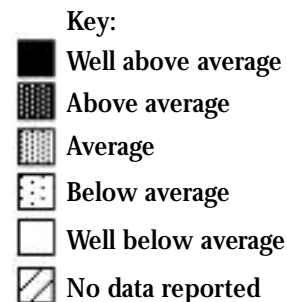
- School district supply rating was in the oversupply range
- Ratio of applicants to vacancies was 27.62
- Ratio of program completers to new hires in field was .28



Pre-kindergarten/Kindergarten

Outlook: Below average

- School district supply rating was in the normal supply range
- Ratio of applicants to vacancies was 29.24



Secondary education

Technical education, business education, family and consumer education

Outlook: Above average

- School district supply rating was in the extreme shortage range
- Ratio of applicants to vacancies was between 4 and 5
- Ratio of program completers to new hires in field was .42 for technology, .35 for business, and .26 for family and consumer education



Science and mathematics

Outlook: Above average

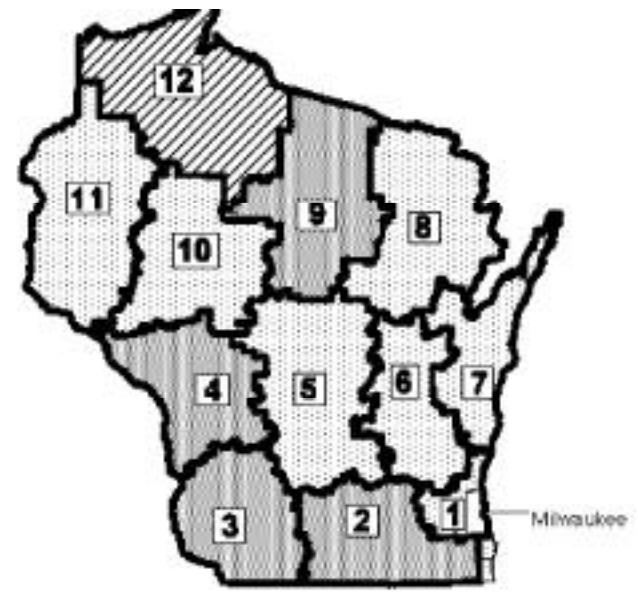
- School district supply rating was in extreme shortage range for physics and chemistry, and the shortage range for biology, earth science, and general science. Supply for mathematics was in the shortage range
- Ratio of applicants to vacancies was 4-7 for physics and chemistry, 10-15 for other science fields and mathematics
- Ratio of new hires to program completers was .24 to .28



Social studies

Outlook: Well below average

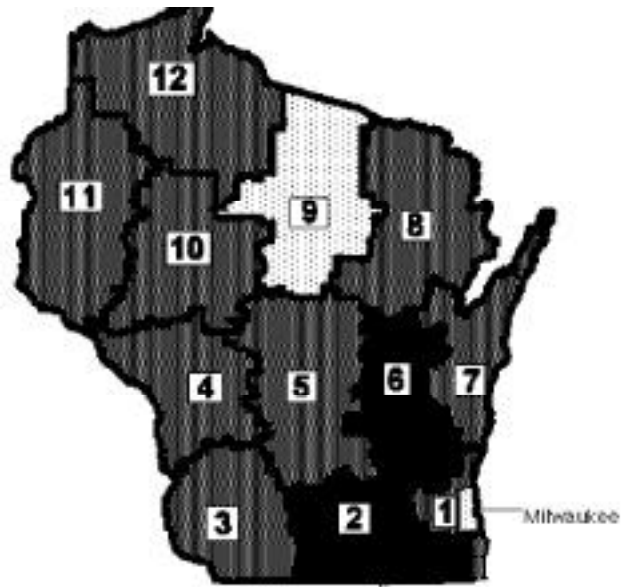
- School district supply rating was in the slight oversupply range
- Ratio of applicants to vacancies was 36.4
- Ratio of program completers to new hires in field was .16



Physical education

Outlook: Well below average

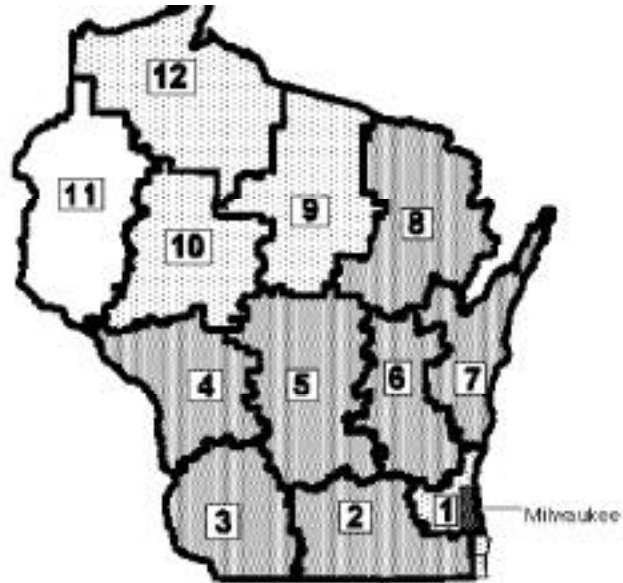
- School district supply rating was in the oversupply range
- Ratio of applicants to vacancies was 21.8
- Ratio of program completers to new hires in field was .28



English/Speech/Journalism

Outlook: Below average

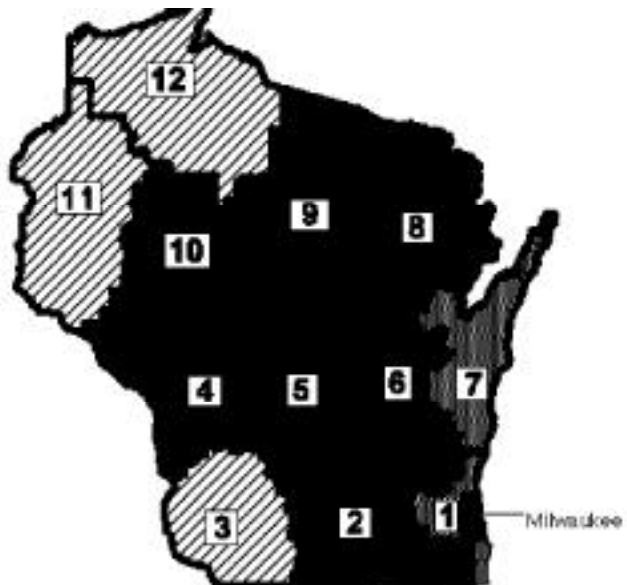
- School district supply rating was in the normal supply range
- Ratio of applicants to vacancies was 12.5 for journalism/speech and 19.8 for English
- Ratio of program completers to new hires in field was .22



ESL/Bilingual

Outlook: Above average

- School district supply rating was in the oversupply range
- Ratio of applicants to vacancies was 27.62
- Ratio of new hires to program completers was .19



Key:

- Well above average
- Above average
- Average
- Below average
- Well below average
- No data reported

Special education

Most special education fields were rated as having a shortage of available teachers. Hearing and visual impairments were ranked first or second in both the applicants to vacancies ratio and the supply rating, meaning both areas show extreme shortages. The outlook in speech and language pathologist likely has dropped due to recent decreases in the demand for speech and language pathologists in the medical field. Special education has historically had a higher attrition rate than general education. There also tend to be more teachers who transfer from special education to general education than vice versa. Below are the three largest special education categories.

Learning disabilities

Outlook: Average

- School district supply rating was in the shortage range
- Ratio of applicants to vacancies was 6.2



Emotional disturbance

Outlook: Well above average

- School district supply rating was in the extreme shortage range
- Ratio of applicants to vacancies was 4.0



- Key:
- Well above average
 - Above average
 - Average
 - Below average
 - Well below average
 - No data reported

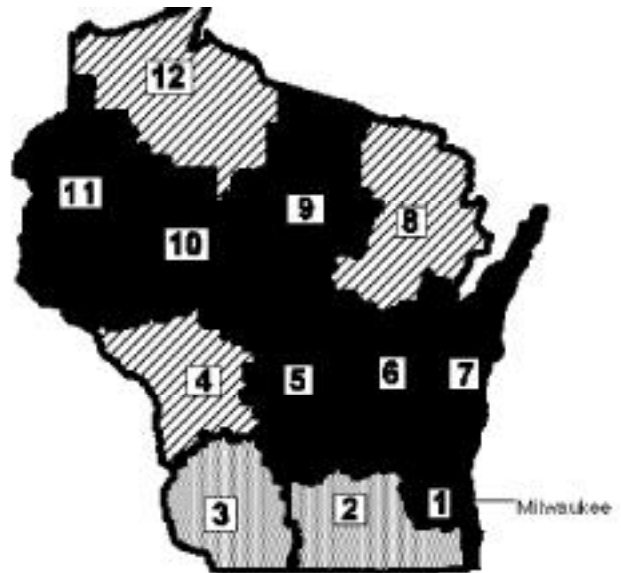
Cognitive disabilities
 Outlook: Above average

- School district supply rating was in the shortage range
- Ratio of applicants to vacancies was 4.9



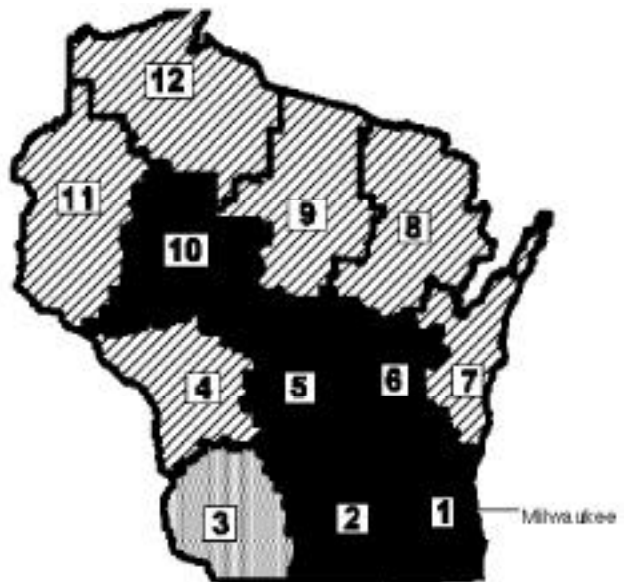
Vision impairment
 Outlook: Well above average

- School district supply rating was in the shortage range
- Ratio of applicants to vacancies was 1.5



Hearing impairment
 Outlook: Well above average

- School district supply rating was in the shortage range
- Ratio of applicants to vacancies was 1.5



- Key:
- Well above average
 - Above average
 - Average
 - Below average
 - Well below average
 - No data reported

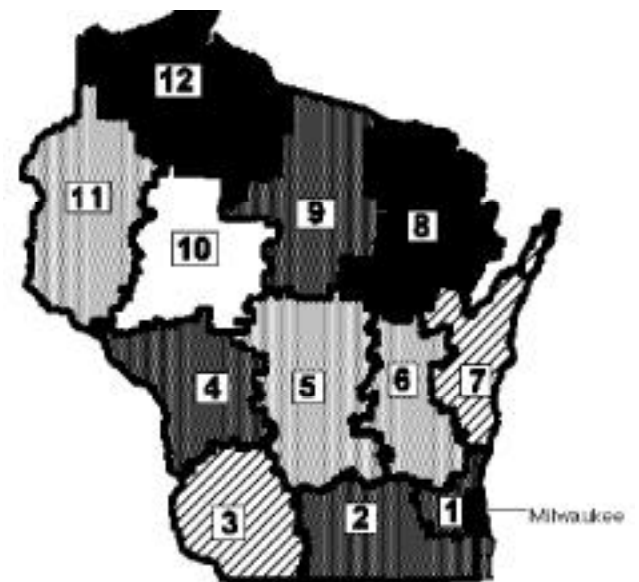
Speech and language pathologist
Outlook:Average

- School district supply rating was in the shortage range
- Ratio of applicants to vacancies was 6



Early childhood special education
Outlook:Average

- School district supply rating was in the shortage range
- Ratio of applicants to vacancies was 5.5



Physical therapist/Occupational therapist
Outlook:Average

- School district supply rating was in shortage range
- Ratio of applicants to vacancies was 3



- Key:
- Well above average
 - Above average
 - Average
 - Below average
 - Well below average
 - No data reported

References

Gerald, D. J. & Hussar, W. J. (1999). Projections of educational statistics to 2009. Washington, DC: U.S. Department of Education.

National Center for Education Statistics (2000). Overview of national elementary and secondary schools and districts: School year 1998-1999. Washington, DC: Author.

Wisconsin Department of Public Instruction (1999). Basic facts about Wisconsin elementary and secondary schools. Madison, WI: Author

Appendix A

Appendix B

Appendix C
