Improving enrollments in

College of Southern Nevada

Computing & Engineering Technology

Sabbatical Report – Spring 2008

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Abstract

Concern for the declining enrollments in the Computing and Engineering Technology (CET) department over the past several years motivated me for a sabbatical project. I took on the task of exploring the issues of the declining enrollments in our programs and the availability of jobs in the markets within those programs. The research showed job growth projections are high, very high, in the computing/technology career fields as compared to other fields over the next decade but with one drawback. The research showed job growth is projected to be very high for students with bachelor degrees in the computing/technology areas and almost non-existent for associate degrees and certifications as it was in the past. This research led to my recommendations of enhancing and expanding the CET department's courses and programs to improve our students' education, increasing their chances when entering the job market and benefiting from this growth. It is also essential to the growth and sustainability of our department. I recommend adding two computer science courses to our offerings for our students' transferability and our program enhancement; CS 115 Introduction to Computers and CS 135 Introduction to Computer Science. I recommend working toward the CET department offering a four year technical degree in several areas of emphasis within computing/technology. I also recommend expanding greatly our 2+2 transfer agreements with colleges and universities that offer degrees in management, research and scientific areas such as computer science, engineering, and management information systems. A few of these recommendations can be done immediately and with little effort, others will take more research and discussion to determine if they are the best options for our students. Any way you look at it our students' education will benefit greatly from us enhancing and expanding our CET programs.

Improving enrollments in

College of Southern Nevada

Computing & Engineering Technology

The Computing and Engineering Technology (CET) Department at the College of Southern Nevada (CSN) uses state of the art technology 'to teach computer, information, and engineering technologies for degree seekers, transfer students, industry certification, professional development, computer literacy, and personal enrichment' as defined in our departmental mission statement developed in January 2005. Our programs in the CET department are ever changing keeping pace with the industry and answering the needs of our community and the work force. Enrollments in the CET department courses were on a steady decline after the technology bubble burst, referred to as the dot-com crash, at the end of the 1990's. The CET department enrollments started declining fall '99 after our peak highpoint. It appears the decline in enrollments may have leveled out with projections for 2007-08 are showing a minor increase.

Enrollments around the country in computer/technology related courses were on a decline since the technology bust of the early 2000s. This seemed to be blamed mainly on the decline or *crash* of the stock market's internet sector and related fields of newly founded internet-based companies called dot-coms. The bubble of dot-coms lasted from approximately 1995 – 2001 when stock prices and market share in these newly founded internet-based companies were at a high.[1] The fast paced growth the end of the '90s fueled the need for jobs in the computing and engineering fields which in turn fueled enrollments in programs that related to these fields. When the dot-com bubble burst in this sector causing jobs to decline at a very fast pace, it seemed, so did the enrollments in those programs. A few courses seemed to be exempt from this

[1] Public Broadcasting System (PBS). Frontline. The dot.con http://www.pbs.org/wgbh/pages/frontline/shows/dotcon/

decline, but not many.

Since jobs related to the dot-com situation suddenly disappeared many felt that education and training in these areas at that point was not needed and it appears to be the reason that enrollments dropped. But the fact that computers and technology are still used in just about everything we touch on a day-to-day basis, and computing/technology changes daily, should show there is still the need for educated/trained workers in computing/technology related fields. This decline has already stemmed a national concern for not enough educated and trained employees in the Science, Technology, Engineering, and Mathematics (STEM) occupations within the next several years as the baby boomers start to retire.[1] Much of the data I collected on this topic, specifically job trends and forecasts, comes from the U.S. Department of Labor relating to the technology/computing job market from the Bureau of Labor Statistics.[2] The research showed the need for jobs in the career areas for computer and related fields increasing and with a possible shortage of educated and trained workers in those areas through 2016.[3] There may be a crisis on the horizon if the projected numbers come to fruition. The needs have shifted from what used to be acceptable for careers in these fields prior to the dot-com era. Industry certifications and some practical experience in the *field* used to be all that was needed for fairly good paying professional jobs in these areas. Now many employers, including our own CSN and all the Nevada System for Higher Education (NSHE) institutions, require a bachelor degree in a related field as a 'required' qualification with industry certifications as optional qualifications.[4] The Bureau of Labor Statistics data states that bachelor degrees or higher are required more and more for the fastest growing jobs in the computing industry. More than 80%

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[1] U.S. Government Accountability Office. Report to the Chairman, Committee on Rules, House of Representatives. (Oct 2005) Higher Education: Federal Science, Technology, Engineering and Mathematics Programs and Related Trends

[2] Bureau of Labor Statistics, U.S. Department of Labor, on the internet at http://www.bls.gov

[3] Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook 2006-07 & 2008-9 Editions. Electronic versions are available at http://www.bls.gov/oco/.

[4] Nevada System of Higher Education; Code: Title 2, Chapter 5, Section 5.10.2(a), Personnel Policy for Faculty

of the jobs forecasted for Computer Software Engineers, one of the fastest growing areas, require a bachelor degree or higher.[1]

Technology Degrees

My research led me in two directions when studying data found in this area. The first was technology degrees at other institutions, specifically graduation rates; and the second area was statistics on the job market, specifically job trends and forecasts. Research on technology programs at other institutions around the country showed a clear direction of courses that led to full degree related programs rather than just individual 'training' type courses as in the past. It was clear that higher education was answering the industry needs through courses that lead to specific technology degree programs rather than just occupational or industry certifications. Many of these programs are bachelor degree programs rather than associate degree programs. The two year associate degree programs were just stepping stones to bachelor degrees at the same institution or *2 + 2* programs partnered with other institutions. The July 16, 2007 issue of Community College Week gave a ranking of the top 50 associate degree producers in many degree areas. One of these areas was *Computer and Information Sciences & Support Services* which is the area I have been researching. The chart from that issue and specialty area is shown on the next page. Out of the top 15 associate degree producing institutions only three of them were two year institutions. The remaining 13 top associate degree producing institutions were four year institutions.[2] This trend of four year institutions becoming top producers in associate degrees is not new.

[1] Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, Edition 2008-09; Computer Software Engineer. On the internet at http://www.bls.gov/oco/pdf/ocos267.pdf

[2] Community College Week, July 16, 2007; Top 100 Associate Degree Producers 2007; http://www/ccweek.com

Released
July 8, 2007

TOP 100 associate degree producers 2007

TOP 50 ASSOCIATE DEGREES:
Computer and Information Sciences & Support Services

2006 RANK	INSTITUTION	STATE	2004-2005 TOTAL	PRELIMINARY 2005-2006 MEN	WOMEN	TOTAL	PERCENT CHG.
	Two-Year Institutions						
6	CUNY Borough of Manhattan Community College	NY	182	141	73	214	18
12	Technical Career Institutes	NY	175	134	16	150	-14
15	ITT Technical Institute-Getzville	NY	98	104	27	131	34
16	Katharine Gibbs School-New York City	NY	199	91	26	117	-41
17	ITT Technical Institute-Austin	TX	94	90	26	116	23
19	ITT Technical Institute-Strongsville	OH	144	97	17	114	-21
20	Fox Valley Technical College	WI	113	89	24	113	0
21	Stark State College of Technology	OH	104	79	33	112	8
22	ITT Technical Institute-Arlington	TX	62	89	21	110	77
25	ITT Technical Institute-Richardson	TX	95	72	28	100	5
30	Central New Mexico Community College	NM	66	54	39	93	41
31	Milwaukee Area Technical College	WI	160	66	26	92	-43
31	Gateway Technical College	WI	86	63	29	92	7
34	ITT Technical Institute-Pittsburgh	PA	93	72	18	90	-3
34	YTI Career Institute	PA	91	85	5	90	-1
37	Heald College-Honolulu	HI	82	73	16	89	9
38	Texas State Technical College-Waco	TX	176	72	16	88	-50
41	CUNY La Guardia Community College	NY	86	61	24	85	-1
41	Florida Career College	FL	129	50	35	85	-34
43	ITT Technical Institute-Youngstown	OH	83	61	21	82	-1
45	Brooks College-Long Beach	CA	106	51	30	81	-24
45	Heald College-Hayward	CA	98	58	23	81	-17
49	ITT Technical Institute-Canton	MI	56	66	14	80	43
	Four-Year Institutions						
1	ECPI College of Technology	VA	463	371	372	743	60
2	Full Sail Real World Education	FL	404	283	43	326	-19
3	American Intercontinental University Online	IL	310	138	158	296	-5
4	High-Tech Institute-Phoenix	AZ	257	216	52	268	4
5	ECPI Technical College-Richmond	VA	172	116	99	215	25
6	Kaplan University	IA	119	121	93	214	80
8	DeVry University-New Jersey	NJ	185	174	37	211	14
9	Keiser College-Ft Lauderdale	FL	257	147	52	199	-23
10	Strayer University	DC	23	114	77	191	730
11	New England Institute of Technology	RI	150	139	25	164	9
13	Collins College	AZ	223	100	40	140	-37
14	Robert Morris College	IL	173	93	41	134	-23
17	DeVry University-Illinois	IL	2	63	53	116	5700
23	Briarcliffe College	NY	105	90	17	107	2
24	Monroe College-Main Campus	NY	0	68	36	104	na
26	Coleman College	CA	154	71	28	99	-36
27	ITT Technical Institute-San Diego	CA	114	84	14	98	-14
28	ITT Technical Institute-San Bernardino	CA	92	83	13	96	4
29	ITT Technical Institute-Indianapolis	IN	94	76	18	94	0
31	ITT Technical Institute-Mount Prospect	IL	59	74	18	92	56
34	ITT Technical Institute-San Dimas	CA	122	77	13	90	-26
39	ITT Technical Institute-Green Bay	WI	80	71	15	86	8
39	The Art Institute of Houston	TX	82	55	31	86	5
43	ITT Technical Institute-Henderson	NV	81	64	18	82	1
45	Davenport University	MI	78	51	30	81	4
45	ITT Technical Institute-Louisville	KY	93	67	14	81	-13
49	Miami Dade College	FL	120	51	29	80	-33

Source: *Community College Week* Analysis of U.S. Department of Education Data

http://www.ccweek.com/top100-07charts/Computer-and-Information-Sciences.pdf[1]

[1] Community College Week, July 16, 2007 Edition; http://www.ccweek.com/top100-07charts/Computer-and-Information-Sciences.pdf

Top 15 Associate Degree Producing Institutions

Year	4-Yr Institutions	2-Yr Institutions
2007	12	3
2006	10	5
2005	8	7
2004	7	8
2003	6	9

http://www.ccweek.com/Top_100_Archives.aspx

The table above displays data from the Community College Week top associate degree producers analysis over the last five years.[1] It shows the trend of four year institutions associate degree completions versus two year institutions' degrees from 2003-07. The opportunity for the associate degree student to continue their education through the completion of their bachelor degree at four year institutions seems enticing. This table is in complete agreement with the data published from The Bureau of Labor Statistics explaining the forecasted future job markets. Data shows more and more employers are requiring bachelor degrees for hiring in a professional or salaried position. CSN as an employer has followed that trend with us now requiring a bachelor degree to be hired in a full time professional position as stated in the NSHE Code. The Bureau of Labor Statistics publishes data on the required education levels and training needed for certain job markets and forecasts future markets as well.

Job Trends

More data points to the bachelor degree trend in technology related programs. The Occupational Outlook Handbook is published by the Bureau of Labor Statistics every two years. The 2006-07 Edition really showed the need for bachelor degrees in the computing technology areas through the year 2014. Table 1 – The Fastest growing occupations and occupations projected to have the largest numerical increases in employment between 2004 and 2014, by

[1] Community College Week, Top 100 Associate Degree Producers; http://www.ccweek.com/Top_100_Archives.aspx

level of postsecondary education or training is shown below. This table is from U.S. Department of Labor, Bureau of Labor Statistics, Bulletin 2600 updated December of 2005. It really explains the potential job market for computing/technology fields.

Occupational Outlook Handbook, 2006-07 Edition

U.S. Department of Labor | Bureau of Labor Statistics | Bulletin 2600

Table 1. Fastest growing occupations and occupations projected to have the largest numerical increases in employment between 2004 and 2014, by level of postsecondary education or training

Bachelor's degree	Fastest growing occupations	Occupations having the largest numerical job growth
	Network systems and data communications analysts	Elementary school teachers, except special education
	Physician assistants	Accountants and auditors
	Computer software engineers, applications	Computer software engineers, applications
	Computer software engineers, systems software	Computer systems analysts
	Network and computer systems administrators	Secondary school teachers, except special and vocational education
Associate degree		
	Physical therapist assistants	Registered nurses
	Dental hygienists	Computer support specialists
	Forensic science technicians	Dental hygienists
	Veterinary technologists and technicians	Paralegals and legal assistants
	Diagnostic medical sonographers	Medical records and health information technicians

Modified Date: December 20, 2005: Source: **Bureau of Labor Statistics** http://www.bls.gov/[1]

As you can see in the Occupational Outlook table 2006-07 Edition for 2004-2014, four of the top five fastest growing occupations with a bachelor's degree are in the computer/technology areas. Also in the occupations projected to have the largest numerical increase in employment two of the five top occupations are in the bachelor degree area in comparison to the associate degree statistics.

[1] Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook: Table 1. Fastest growing occupations and occupations projected to have the largest numerical increases in employment between 2004 and 2014, by level of postsecondary education or training. The data shown here is only a portion of the data depicted in the table. The entire table has data education and training levels from short-term on-the-job training through doctoral degree and first professional degree levels. Only the associate and bachelor degree levels are displayed. Modified Date: December 20, 2005: Source: **Bureau of Labor Statistics** http://www.bls.gov

The job trends are a wakeup call for associate degree graduates that are not planning to continue their education on to complete a bachelor degree. These statistics show the need for computer/technology programs to extend beyond the associate degree level and/or prepare students that graduate with an associate degree to continue with their education either at the same institution or work with a 2+2 agreement to complete their bachelor degree. The updated Occupational Outlook table 2008-09 Edition just published in December 2007 continues this trend in the computer science and information systems programs. Below are three of the top occupation areas.

The **computer systems engineer** is projected to be one of the fastest growing occupations over the next decade with growth of approximately 38% from 2006-16. [1] This occupation is broken down into two areas; applications and systems software. Each of these areas is expected to grow by 45% and 28% respectively during that decade. These are huge numbers for job growth. This report specifies a broad range of tasks and responsibilities that computer systems engineers need skills for, including the design and development of software such as computer games, word processing and business applications, operating systems, and network distribution. Many of the job skills require being proficient at programming languages such as C, C++ and Java. CSN has the resources and capability to answer the needs of this job market with educated workers in these fields. We currently have many of the programs in this occupational area. Our programs and curriculum need to be enhanced to be able to answer this call on the level needed.

The **computer scientist and database administrator** is projected to also be one of the fastest growing occupation areas over the next decade with growth of approximately 37% from

[1]Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook 2008-09 Edition, Computer Software Engineers; on the internet at http://www.bls.gov/oco/ocos267.htm

2006-16.[1] This computer specialist occupation area is quite extensive and includes computer scientists, database administrators, network systems and data communication analysts, and telecommunications specialists. This area will be broken down into individual specialties starting with computer scientist. The *computer scientist* occupation is more of a researcher position. It involves theoretical expertise and possibly works with inventions and patents. This area lends itself more to a 2+2 situation with transfer agreements to universities that have full computer science programs. The *database administrator* occupation works with storing and managing data and data warehouses. This occupation works more with users and their needs for extracting and integrating data. Workers must understand system performance issues and platforms on which the data resides ensuring data integrity and backup/restore capability. CSN has many of the courses needed to fulfill a program such as this. We have the resources and capability to also answer the needs of our community for this job market. We will need to review the overall needs of a degree program for this area and update and/or enhanced our courses to be able to answer the call for this occupation. The *network systems and data communication analysts* are also within this occupational area. This area works with local area and wide area networks hardware and software, internet and intranets, and wireless solutions. CSN has the resources and capability to answer the needs of this job market with educated workers in these fields. We currently have many programs in this area. We are nationally known for our Cisco program and would be able to work with this. Our programs and curriculum will need to be enhanced to be able to answer this call on the level needed. The *telecommunication specialists* occupational area is not as specifically defined as the others mentioned here. This area works with more voice and data communication, installing and maintaining services, and designing and maintaining web sites. CSN also has the resources and capability to answer the needs of this job market with

[1]Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook 2008-09 Edition, Computer Scientists and Database Administrators; on the internet at http://www.bls.gov/oco/ocos042.htm

educated workers in these fields. We currently have programs in this occupational area. Our programs and curriculum will need to be enhanced in this area to be able to answer this call on the level needed.

The **Computer Systems Analyst** occupation area designs and develops computer systems including hardware and software.[1] Systems areas include business, financial, manufacturing or engineering systems. This area normally requires a bachelor's degree in computer science, information science, or management information systems. This area lends itself more to a 2+2 situation with transfer agreements to universities and colleges that have these programs.

Recommendations

My sabbatical leave was during the fall 2007 when this research was completed. The topic area of enhancing our programs and working on a four degree program lends itself to much more extensive research. The analysis I completed and the summaries I have discussed in this report are topical in nature and would need much more time and discussion in the CET department to work through the specific details if they are accepted. I have three overall recommendations based on the research and statistics listed in this report. These recommendations may be taken separately or worked on all at the same time if it is decided that any/all of these recommendations would take the CET department in the direction needed for improving our students' career opportunities.

The first recommendation is to increase the CET course offerings to include two new computer science courses. These recommended courses were standard courses in most of the computer/technology programs I researched. The second recommendation is to expand the CET department's degree offerings to include four year degrees at CSN in technical/occupational

[1] Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2008-09 Edition,* Computer Systems Analysts, on the internet at http://www.bls.gov/oco/ocos287.htm

areas projected to be the top occupational growth areas. The third recommendation is to develop and/or expand 2+2 transfer programs with colleges and universities to include the high job growth areas such as computer science theory, research, and management degrees that are non-occupational and non-technical in nature.

Recommendation #1 is to increase the CET course offerings to include two computer science (CS) courses. Every computer/technology program I studied had a few basic courses in common. The course titles were not necessarily the same but the course descriptions were very similar. With a little work and a lot of discussion, base requisite courses could be standardized to allow for maximum transferability and degree course objective coverage. These courses would also be transferable as well to UNLV and NSC as well as many other colleges and universities. Several of UNLV's degrees and a few of NSC's degrees require these courses as either prerequisite or required for the degree. I recommend the CET department add the CS 115 – Introduction to Computers course to our course offerings. This course would be the computer science equivalent to our IS101 – Introduction to Management Information Systems course because it has a math prerequisite. The CS 115 course adds computer science objectives to it but would really increase our students' transferability to other four year institutions. It also is prerequisite to several other computer science courses required for many of the CS degrees as well as several science, engineering and health science degrees. The course description for CS 115 is listed in the appendix at the end of this report. The CET department needs to add one more CS course to its offerings; CS 135 – Computer Science I or Introduction to Computer Science. This course is a requirement to many of the CS degrees as well as science and engineering degrees at UNLV, NCS and other four year institutions that we may want to have 2+2 transfer agreements with in the near future. This course looks to be close in objectives to our Introduction to Programming course (IS 115) but it requires a math component for computer

science that IS 115 at CSN does not currently have in the objectives. I believe we have several professors that have a math background or possibly someone from the math department may be qualified to teach this. This would definitely have to be looked into and discussed in detail with both the CET and Math departments and the professor(s) that would teach the course. Adding the CS 135 course will also help with our science degrees and engineering transfer students as they would be able to take one more course at CSN before transferring to UNLV, NSC or other four institutions for their degrees. This will help with enrollments in the CET department and also help our students in their degree efforts. I also recommend both of these courses be equivalent to or cover required courses at CSN as follows:

IS101 = CS 115

IS115 = CS 135

Adding these two courses to the CET course offerings will really benefit CSN students for many reasons not the least being transferability. If our current degrees will allow all of the above recommended substitutions they will benefit in more ways than one. These two recommended courses are required or prerequisite to many different degrees at multiple institutions in areas such as computer science, computer systems analyst, computer information systems, computer engineers, database administrators, network system and data communication analysts, and other many other miscellaneous computer/technology areas many of these degrees of which are at the top of the job growth tables as discussed in the report above. They are also required courses for other degrees such as health science, hotel administration, and urban affairs to just name a few.

Recommendation #2 is to expand the CET department's degree offerings to include four year degree programs at CSN in technical/occupational areas projected to be the top occupational growth areas. I know this is a very political request, but one I feel is the best recommendation

for our students. Based on my research and the statistics published at the Bureau of Labor Statistics for the occupational outlook from 2006-16, there are three different areas/programs that are projected to be the top growth occupations in the next decade. The titles or names of these programs can be a multitude of things, but the core knowledge and skills is what is important. I will be as generic as possible in discussing these programs. More research and discussion will be needed to work through specifics for this recommendation. These areas/programs recommended for four year degrees at CSN are computer systems specialist with emphasis in systems software or applications, database administration, and network systems analyst/data communications. These are very technical in nature which would lend itself much better to our CSN mission and not business management, science, or engineering in nature as would four year programs at a university or state college. The southern Nevada four year institutions, UNLV and NSC, do not have any of these technical specialties in their program offerings.

The first of these programs I recommend for a four year degree is **computer systems specialist**. This program would need two different areas of emphasis based on the Occupational Outlook report from the Bureau of Labor Statistics; *systems software* and *applications*. These areas of emphasis are both software related and could be worked in one degree as long as key objectives are met in the degree. Areas I have found are software logic and data structures, problem solving and algorithm design, advanced application software and system software programming. Our current Computing and Information Technology degree has several areas of emphasis; one of these being programming. This current program would be able to be expanded to include upper level software, logic and data structure curriculum for upper level courses.

The **database administration** degree is the second four year degree I am recommending for developing database administrators (DBA). This occupation's job growth is expected to grow at 37% over the next decade as described above and a four year technical program such as

this would benefit our students immensely. Many of this degree's lower level courses we already offer. Our Computing and Information Technology degree currently has a database emphasis. Expanding this program to include upper level courses would allow for much broader coverage of essential areas our students would need to pursue a valued career in database administration such as data warehousing, data structures, and data architecture. This degree area is needed as institutions that have this specialty in their degree programs are few and far between. Many DBAs have degrees in other related fields but must learn the essential skills of this occupation in the field and by trial and error. Having a degree in this specialty at CSN would allow graduates to learn essential skills, and through intern programs gain valuable experience, needed to step into a DBA position after graduation with the required credentials fresh out of college.

The **network systems analyst/data communications** degree area is the third four year degree program I am recommending at CSN. The intense growth of the internet and the expanding use of intranets in business make networks large and small essential tools for today's business. This field is expanding greatly with specialty areas popping up in hardware and software. Careers in areas such as network systems analysis and data communications including telecommunications are in the top growth jobs for the next decade. Many of the computer and technology programs I researched include networking and data communications as an emphasis area but not a degree area as specified is needed through the Department of Labor. Answering to the call of our community and needs of our students is what we do. Our Cisco, Microsoft, and telecommunications programs at CSN currently offer many of the required areas for a four year degree such as this. Expanding this to a four year degree to include many of the skills our students would normally have to learn *on the job* would once again give them the edge in the job market. Giving them the opportunity in a controlled, facilitated setting under the guidance of our

experienced faculty to work with the equipment and real-world scenarios is what we pride ourselves on and what our community expects from our graduates.

These three degree programs are my recommendation for additional four year degrees at CSN. Any or all of these would take us to the next step of service for our students in the technical/occupational degree areas. Since we reworked our associate degree in the Computing and Information Technology area, one four year degree in the Computing and Engineering Technology area with the three emphases may also work to cover the required objectives for these occupational areas. More research and much discussion are needed, but this service to our students should not be dismissed. This next decade job growth and career opportunities as listed in the Occupational Outlook report from the Bureau of Labor Statistics are trying to tell us something. Let's start listening and acting on this now!

Recommendation #3 is to develop and/or expand 2+2 transfer programs with colleges and universities to include the high job growth areas that are non-technical in nature such as computer science theory, research, and management degrees. These are the degree areas that are more research based for publishing or patent creation, more management, medical or science driven than occupational or technical. These are the areas that the National Employment Matrix and Department of Labor consider scientific or mathematical in origin and would place graduates in higher positions of management hierarchy. These degrees would also be the most likely candidates for graduate programs. Many of our students like to start out their education at CSN to get their feet wet and be able to work and/or raise a family and go to school. They also like the lower student to teacher ratios at CSN and the genuine concern and love of teaching they get from our faculty. Putting together more 2+2 transfer programs in the areas of Computer Science, Management Information Systems and Engineering would allow our students more avenues to start their education at CSN and then move on seamlessly to the institution of their choice. I

would also make a strong recommendation for 2+2 distance learning degrees so they may continue to live and work in the location they choose and their education is not dictating that location. There are many colleges and universities across the nation that are looking for opportunities to work with institutions such as CSN for 2+2 transfer agreements. We need to search these out and set as many agreements up for our students now so they may take advantage of the job growth opportunities in the next decade.

Summary

My sabbatical project research initially was to find out why enrollments in the CET department were not increasing in a time when computers/technology is expanding in leaps and bounds. Working towards that goal originally, my research actually led me in another direction. Within the first few weeks of starting this research it was obvious to me that our students needed more than what we at CSN currently offered in our CET programs in the area of computing/technology. This information changed my direction and started me researching not just our curriculum but the programs and degrees our curriculum led to not just specific courses or certifications. The Bureau of Labor Statistics under the Department of Labor publishes several different reports and is responsible for our national job market analysis and statistics.[1] Since many of the top job growth markets were in the computing/technology areas over the next decade my recommendations concentrated on occupations in those fields. Our programs are not far off to answering that need with some adjustments and enhancements. My recommendations for the CET department and programs reflect just this. Adding a few CET courses to our catalog, work on bringing in to CSN a few four year technical degrees to our students, and extending our 2+2 transfer programs in the computing/technology areas with other colleges and universities around the country are ways we can truly help our students and our community.

[1]Bureau of Labor Statistics, U.S. Department of Labor,. http://www.bls.gov/

Granted there may be some political barriers to accomplishing these recommendations. These few items are recommended with one thing, and one thing only in mind, our students. A few of the recommendations will take a little effort and a few minor changes in our course offerings. We can start on a these items today. It will not take that much to accomplish and our students will have a better, more well-rounded portfolio of classes to transfer. Our students will start to benefit immediately with a few changes. The other more political recommendations will take a lot more effort and quite a bit more time to work through the debates on whether we should have more four year degrees at CSN. The time is now to start working through these issues for our students. If we start now our programs will be enhanced and our students start to benefit as soon as possible for this growing job market.

References

Bureau of Labor Statistics. U.S. Department of Labor. http://www.bls.gov

Bureau of Labor Statistics. U.S. Department of Labor. (2007, 2008). *Occupational Outlook Report*. (2006-07 and 2008-09). Electronic version: www.bls.gov/oco

Bureau of Labor Statistics. U.S. Department of Labor. *Occupational Outlook Handbook* (2008-09). *Computer Scientists and Database Administrators*. http://www.bls.gov/oco/ocos042.htm

Bureau of Labor Statistics. U.S. Department of Labor. *Occupational Outlook Handbook. (*2008-09). *Computer Software Engineers.* http://www.bls.gov/oco/pdf/ocos267.pdf

Bureau of Labor Statistics. U.S. Department of Labor. *Occupational Outlook Handbook.* (2008-09). Computer Systems Analysts. http://www.bls.gov/oco/ocos287.htm

Community College Week, July 16, 2007. *Top 100 Associate Degree Producers 2007*; http://www/ccweek.com

Community College Week. Top *100 Associate Degree Producers*; Archives: http://www.ccweek.com/Top_100_Archives.aspx

Nevada System of Higher Education Code. Title 2, Chapter 5, Section 5.10.2(a). *Personnel Policy for Faculty*. http://system.nevada.edu/Board-of-R/Handbook/Title-2/T2-CH05.doc_cvt.htm.

Public Broadcasting System (PBS). Frontline. *The dot.con*. [Radio] Airdate: January 24, 2002. http://www.pbs.org/wgbh/pages/frontline/shows/dotcon/.

U.S. Government Accountability Office. Report to the Chairman, Committee on Rules, House of Representatives. (Oct 2005) *Higher Education: Federal Science, Technology, Engineering and Mathematics Programs and Related Trends*.