University of Northern Iowa
Transfer Bridge

<u>**OVERVIEW**</u>

Executive Summary

The "Transfer Bridge Project" was an attempt to bring current EDI technology to bear upon an application, which would most benefit students. The goal was to bring complete degree information to potential transfer students as quickly as possible. The thought is that if you can provide the best information in the quickest manner you will likely secure the commitment to your institution from the inquiring student. This project provides the maximum service to the student while supporting institutional enrollment management goals.

The project was designed to receive transfer course information via TS 130 and to immediately launch this information into transfer course evaluation and degree audit automated systems. The goal is to provide as close to immediate as possible feedback to the student.

Mission and Philosophy Statements

Mission statement for the Division of Educational and Student Services:

"Our mission is to promote a student-centered university, characterized by high academic standards, enriched learning experiences, and stimulating student-faculty-staff interaction.

We value quality, integrity, caring, and teamwork. The values are practiced through leadership and service to students, to each other, and to the university community."

The Office of Admissions and the Office of the Registrar are part of the Division of Educational and Student Services at the University of Northern Iowa. As members, our operational guiding principles are modeled after the mission statement of our division.

One cannot stress enough the attitude of doing more and better for students, which permeates the operational actions of these two offices. Our philosophy is that the status quo is to be avoided at all cost.

When it comes to services for students we are purposefully willing to be risk takers. We choose not to be on the cutting edge of anything but to be ahead creating and defining what others will come to call the cutting edge.

It is this attitude and philosophy which led us enter the educational EDI world at its early stages. We will continue to develop EDI applications for administrative efficiencies which thus free students to be completely engaged in their academic pursuits.

History of the University of Northern Iowa

The University was established in 1876 by enactment of the Iowa General Assembly, and opened on September 6, 1876, as the Iowa State Normal School—"a school for the special instruction and training of teachers for the common schools of the state." The name of the institution was changed 3 times reflecting

an increase role and scope in higher education. On July 1, 1967 the institution was renamed to the University of Northern Iowa.

The University offers a broad curriculum at both the undergraduate and graduate levels. Four conventional baccalaureate degrees are offered: the Bachelor of Arts, the Bachelor of Fine Arts, the Bachelor of Music and the Bachelor of Science. On the graduate level, twelve degrees are offered: the Master of Accounting, the Master of Arts, the Master of Arts in Education, the Master of Business Administration, the Master of Music, the Master of Public Policy, the Master of Science, the Master of Social Work, the Specialist degree, the Specialist in Education degree, the Doctor of Education and the Doctor of Industrial Technology.

The University of Northern Iowa has grown from its 1876 original campus site of 40 acres with one building—Central Hall, which originally housed orphaned children of Civil War soldiers—until it now embraces more than 40 principle buildings on a campus of 740 acres, with a faculty of about 650 members and a total enrollment of about 14,000.

The University of Northern Iowa is one of the nation's finest centers for learning and in Iowa is widely recognized as a leading comprehensive university. For several years running, U.S. News and World Report had identified UNI as second among the best comprehensive universities in the Midwest. As the premier public undergraduate university in Iowa, UNI strives to ensure that its mission and efforts reflect the primary wishes and concerns for education of the people of this state. Our mission statement reflects our commitment to that purpose:

"The University of Northern Iowa is a comprehensive institution committed to providing a diverse, dynamic learning environment, founded on a strong liberal arts curriculum and characterized by excellence in teaching, scholarship and service. The University focuses both on undergraduate education that emphasizes a personalized learning environment and on selected masters, doctoral and other graduate programs that provide students with specialized educational experiences. UNI programs incorporate scholarship and service to individuals, communities and organizations throughout the state, the nation and the world."

History of our Student Information System

In order to understand what you are and what you are capable of doing today, one often needs to look into the past to discover what factors or events led us to this point in time. The following is a quick review of the development of the student information system at the University of Northern Iowa.

Prior to 1982, all academic records were paper documents. We made use of the standard paste on labels listing semester courses and grades. The resultant records were hard copies which could only be corrected or modified with special care and tedious time consuming effort. The glue on the labels had a tendency to bleed through the labels making for a discoloration of the document. All records were stored in large concrete lined fireproof filing cabinets.

To prepare a transcript an individual had to first find the record which was stored in our own unique student number order and then photo copy the paper record. As is usually the case, whichever record you wanted was checked out by someone else who had not filed an 'out' card saying where the record could be found. Or the other common scenario was a record which was misfiled and only to be found after looking through hundreds if not thousands of other paper records. At that time we employed 'record clerks' whose main job was to file, find and update student records. Frankly, I am amazed to this day that more records were not lost or destroyed in this process. So from 1876 to 1982, the Registrar's Office was truly a paper 'Records' office.

In 1977 the Associate Registrar was given the task of developing a true student information system. Representatives from the Office of the Registrar, Office of Admissions, Office of Financial Aid and the Administrative Data Processing Office met on a weekly basis for the next 4 years defining data elements and designing reports. Funding had been secured to purchase a relational database upon which these

systems would be developed. Programming for the new system began in earnest in approximately 1980 with conversion to the new system happening in the fall of 1982.

Prior to 1982, in fact starting in the early 70's, the Office of Admissions began building transfer equivalency files for all course work submitted for transfer to UNI. That system assigned a unique college code number and stored the transfer course number and title while showing the UNI equivalent course number. The impetus for this effort was the development of a community college system in the State of Iowa. Starting in the late 60's we began to receive a substantial number of transfer students from that system. Historically, about one third of our new students each fall are transfer students. For the 2000 fall semester we enrolled 1,167 undergraduate transfer students.

In building the transfer files we evaluated and stored all courses offered at the 15 Iowa public community colleges. We next loaded all courses presented to us from our sister state universities and the private colleges in Iowa. As this university grew so did the receipt of out of state transfer courses, thus causing us to evaluate and store all transfer coursework presented us from anywhere in the world. And one must not forget our own native students who take courses at another institution in the summer or in a special program. So the percentage of UNI students who have at least some transfer credit is very high.

This transfer evaluation system was pretty much paper based. At first we had to look at the transfer college transcript, consult our list of evaluated courses from that school; write up an evaluation summary and enter our final determinations on to the paper academic record. The important part here is the original thinking of creating a master system of course evaluations. At the time technology could not provide what we might have dreamed of but at least a system was being developed to be of immediate help and flexible enough to grow as resources and abilities allowed.

The registration system prior to 1982 consisted of row upon row of pigeon hole boxes which housed IBM punch cards representing one space in a particular section of a course. Our scheduling office looked much like an old time post office. Students would come to the office with their desired schedule of courses and clerks would go from one pidgeon hole to the next pulling cards for the student. You can imagine the anxiety on the part of students as they saw empty box after empty box never know if that was the course they wanted or not.

From Scheduling the packet of cards went to Administrative Data Processing for keypunching. When completed the card had the students unique student number printed on it. The entire set of cards were used to create class lists and semester record files from which class size and staff load information could be drawn.

The individual card was nothing short of magic. If the student decided to withdraw from a course we had to find the individual card that contained that student's number so the card could be re-processed for the grade entry of W. If you realize we had an enrollment at that time of about 11,000 students and if each student on average was taking 4 courses then we had over 44,000 single IBM cards to manage. This came to an end in the fall of 1982 when we launched the online student information system.

As mentioned before, our student information systems were developed all in house. This fact is important to remember as we look to later developments and operating opportunities and/or constraints inherent with legacy systems.

When we converted in 1982 we made use of operator assisted registration. This meant that the student still had to come to our offices where a staff member would enter the registration material for the student. While far more efficient than past systems we knew this could not be the final answer based on a myriad of facts but at least two being a continuing growth in the student body and constant staffing and financial resources.

In 1983 we decided to develop a degree audit system. Again we looked in house for this development. When we purchased our relational database we went with a product that was not an industry standard.

While the system has worked very well for us it has limited our ability to look outside of ourselves for software applications.

A team of people representing academic departments, advising, Admissions, Information Technology Services and the Registrar's Office began development of a degree audit system in 1983. All graduation analysis at both the undergraduate and graduate levels is completed by the Registrar's Office. This meant we could design a system that met our operational needs.

We reviewed current applications that were available. We focused on the DARS system at Miami University and the Georgia State model. This was helpful in giving us a layout but beyond that we on our own. At that time no other degree audit system that we knew of could incorporate transfer credit into a degree audit system. We realized that we were a step ahead because of prior system development in the evaluation of transfer credit. We realized that we had the opportunity to create a complete degree audit system.

In 1985 the degree audit system was implemented. At that time we prepared 3 copies of each students audit. One copy was sent to the student, one copy to the student's advisor and we kept the third copy. The audits were mailed out approximately two weeks prior to advanced registration for the next term. From the very beginning this development was well received and universally adopted. Of course with any new system, enhancement requests were quickly made and we spent time over the next 2 or 3 years refining, expanding and fine tuning the system. Our current degree audit system is basically unchanged from 1988 to the present. We have since added a degree audit program for graduate degrees.

Since 1988 major student information systems development has taken place in the areas of Admissions, Housing and Financial Aid. The records and registration system, while modified, remained basically the same until 1992.

In 1992 the Registrars of the three state universities met to discuss the latest development in student records, something called EDI. We had heard presentations on this development and decided this was the direction we wished to move into. The three public universities in Iowa have a long history of mutual cooperation and support. We realized this was the foundation upon which a statewide effort could be built. So it was agreed we would dedicate people and resources to this effort.

During this same time period we began an effort in conjunction with the Department of Education in the State of Iowa to bring EDI technology to the community colleges and high schools of this state. From this start was born the state wide effort known as Project Easier for transmittal of K-12 records.

The Department of Education provided funding to the state community colleges and public K-12 school systems to purchase hardware and software to support this project. Also the Department of Education contracted with NCS corporation to provide translation, mapping and installation support to the school systems. The state universities provided seminars with the community colleges and provided technical support to any partnering community college.

In 1995 the three universities went into full EDI production using TS 130 to exchange college academic transcripts. At first we used a mixture of VAN's and the Internet to exchange records. We soon realized that to increase our exchange group we needed to move to a networking arrangement and thus we signed on to what has become known as the Texas Server. I would be remiss if I did not comment on the quality, professionalism and expertise that the staff at UT Austin has provided over the years. This group headed by notables Dave Stones and Wally Reaves deserve industry wide recognition for their contributions to EDI in education. Simply put without their support and hard work it is unlikely that EDI would have such a strong foothold in the education world.

Since 1995 it has been a continuing effort to bring more statewide partners into the exchange of records. To date we have only 2 of the largest community colleges exchanging records with the state universities. The exchange of basic educational data between K-12 school systems and the Department of Education has moved more quickly to a point that a majority of the systems are in production. The exchange of academic

records between K-12 systems and colleges has seen some progress with the largest school district in the state now in production with this university. Several more systems have joined the Texas Server system and should be in production yet this year. We look forward to having some of the biggest systems in this state in active exchange with the state universities over the next one to two years.

During this time period the student information system started the transformation to web based applications. In 1995 we implemented student self registration by which students could register themselves using computers in our public student labs. In 1998 we launched web registration and application for admission protocols. We continue to move more student administrative activity to web based applications. Some examples of those applications include:
Housing contracting
Parking permits
FAFSA filing
Change of address
Transcript requests
Event ticketing
Placement interview sign ups
Etc.

With the launching of EDI in 1995 soon came the realization that we wanted to do more with what we were receiving. It appeared to us that we might be able to marry our previous transfer evaluation system with our EDI activity. In 1997 we started an effort which was called the "EDI Bridge Project". The goal of this project was to receive EDI TS130 transmissions and move the information into our transfer evaluation system. This goal was reached in January of 1999.

The remainder of this presentation will tell you the hows and whats of this project but allow me to state that this effort has resulted in a major step forward for our transferring students. The ability to receive TS130's, move them into the transfer evaluation system, on into the degree audit system and finally to posting on the web is a service to students of which we are very proud.

And finally is this history section I must try to take a look into the future. Hopefully what lies ahead is the ever expanded partnering with other institutions and thus servicing more students. We continue to be strong advocates for EDI usage in this state by all educational levels. Our goal is to make the entire student administrative process as invisible and seamless to students as we possible can. We must never forget that our primary function is to support the educational process of our students.

THE TRANSFER BRIDGE PROJECT

Project Overview

University administrators had long been concerned with the time consuming and labor intensive process involved in the receipt of student transcript data, the subsequent transfer course evaluation, and the delivery of degree requirement to potential transfer students. The goal of the project was to capitalize on the efficiencies of electronic data interchange (EDI), and existing transfer course database, our existing degree audit system, and to utilize new web base technology to deliver degree requirements to potential students as quickly as possible.

Environment at UNI

Our Student Information System is a homegrown legacy system, which is mainframe, based and is implemented on an IBM mainframe in an MVS ESA environment. It was developed using the Supra Database Management System and Mantis, which is a 4th generation interactive language from CINCOM.

Project Development

It was determined early on that EDI would need a dedicated programmer/analyst as Information Technology Services did not have the resources to give this project. Our Registrar, Philip Patton, was a champion for this cause, and we now have a half time EDI programmer.

Staff from the Admissions and Information Technology Services met bi-weekly from June 1997 to August 1998. Additional meetings were held as needed from August 1998 until January 1999, until the project was finished.

Features we designed into our system included:
- Store incoming EDI in a stand-alone system. Once the EDI data is reviewed, it is written to our legacy student records databases.
- Store more recent transcript only. Our admission's office disregards older transcripts when a newer one is received, so this makes the process similar to the way it was done with the paper copy. This requires comparing the existing transcript to the newly received transcript and incorporating the changes into our existing databases.
- Utilize our existing transfer course evaluation system, but allow Admission's staff the ability to have the final say on how a course is evaluated. Since the late 60's we have been building a transfer course evaluation system and it has over 142,000 course evaluations stored in that system.
- Ability to process the transcript manually. If the Admission's staff feels that this transcript should be processed manually, rather than using the EDI process, they have the capability to do so. An example of when the Admission's staff uses this manual process is when a UNI student has previous transfer work from a particular school and is now transferring additional credit from the same school to UNI. We want the transfer credit to appear chronologically so we create two separate entries on our transfer evaluation system.
- Ability to reevaluate a transcript. This allows the Admission's office the ability of having all their changes discarded and recreating the evaluation from the most recent copy of the transcript.
- Design the system so that other EDI transaction sets could work with the same databases.

Processing Flow

Each night, personnel in the ITS Office use EDI.Smart to download transcripts sent to the University by it's trading partners through the Internet Server at UT, Austin. EDI.Smart creates a file that is immediately used as input into the transcript course evaluation system which programmatically evaluates each course using the extensive transfer course database maintained by the Record Analysts in the Admissions Office. The determination of a UNI equivalent is the critical first step in creating degree audits and for pre-requisite checking in our registration system. If a transcript already exists for this student from the same institution, the program will compare the information from the previous transcript to the new transcript and update the databases with the changes.

Each morning, the Record Analysts receive reports informing them of which transcripts are ready to be reviewed. They review the evaluated EDI transcript and make changes if necessary. After completing the review of the EDI transcript, the Admission's staff processes the transcript and the course evaluation is completed and the transfer credit is posted to UNI's student records system. Each night, web degree audits are created for all transcripts that have been changed or newly processed. Appendix A contains screen shots which show how a transcript looks after it is processed through our batch programs.

The following diagram shows an overview of the processing flow.
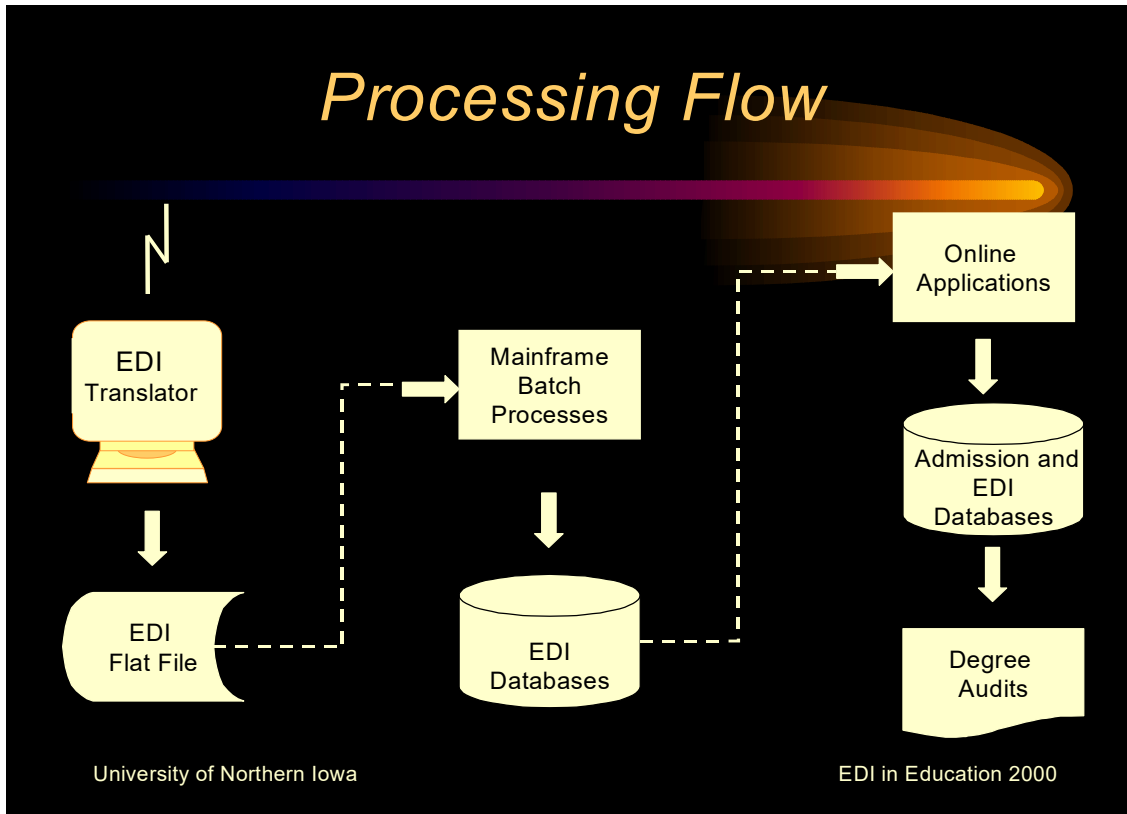
Database Design

We created eight databases to store the EDI data that is needed to evaluate a student's transcript.

The Original Database stores the more recent incoming EDI transcript. We store only 1 transcript per student per institution. This file is used to print the student's transcript as it contains everything we received from the sending institution.

The Institution Database stores the student's name, date received, record status and other pertinent information that is unique to the student from the sending institution.

The Course Database stores the student's transfer courses and their UNI equivalent, as well as other course information such as credit type, grade, session and the grade qualifier.

The Previous Institution Database stores the previous institutions the student attended.

The Summary Database stores the sending institutions summary information.

The Note Database stores all notes the sending institution has sent to UNI. It also stores notes that UNI creates in batch programs when analyzing the EDI transcript. An example of this type of note is the suspension and probation notes. We create notes for information that we feel is important for Admission's to view, but not important enough to require a separate field on the database.

The Transfer Database stores the transfer summary information that will be transferred to our existing Student Records System once the Admission's staff reviews the EDI evaluation.

The Audit Database stores the audit trail records that are created from the batch and online applications. All changes to the student's courses are reflected in the audit database.

The following diagram shows the database design.
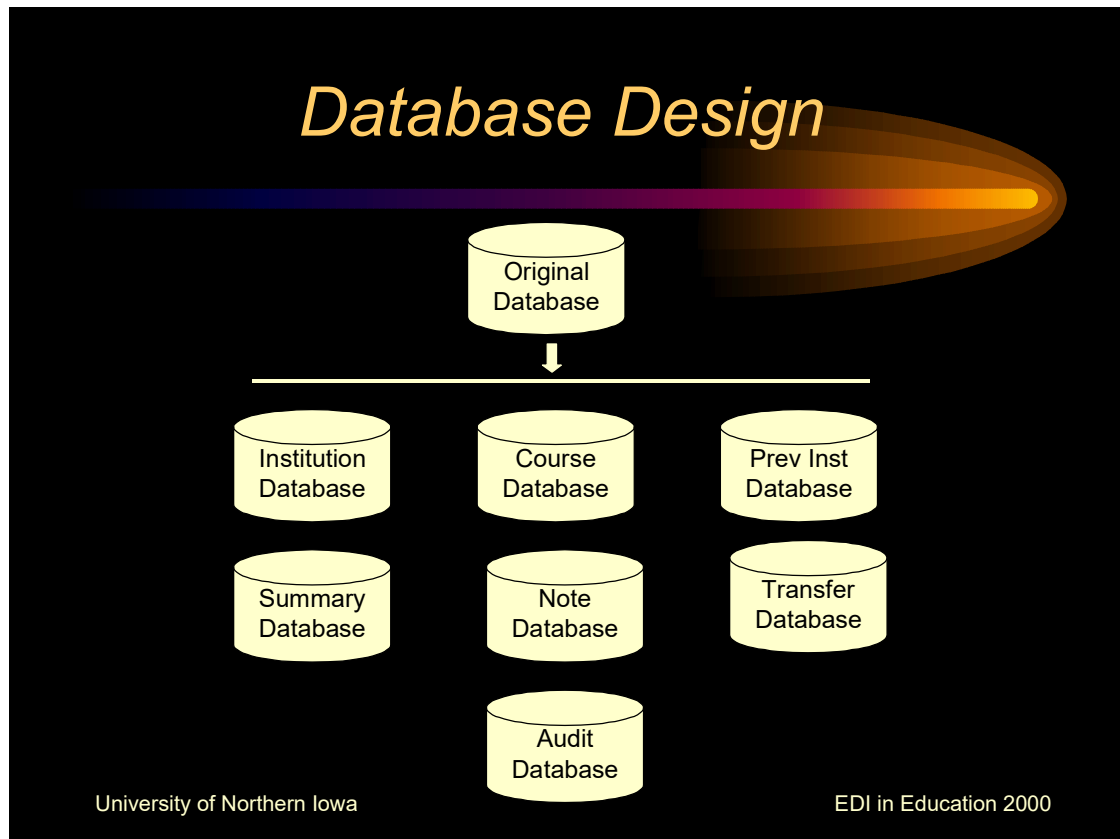
Benefits of the Transfer Bridge

The University of Northern Iowa's Transfer Bridge Project exemplifies a creative and cost effective solution for providing better service to admitted students. Implementation of the Transfer Bridge led to several results:

- Increased services to students whose transcripts were received and processed electronically. Transit and processing time were both significantly reduced, providing faster turnaround time for the student. We had 2900 students submitting transfer work for the previous fall semester. Of these, 29% were processed electronically using our transfer bridge. See Appendix B: Transfer Counts
- EDI transcripts have the same format and thus are consistent in view and use. This is a significant advantage over the endless variety of paper transcripts created by colleges and universities. See Appendix C: Printed Transcript
- With the automatic processing of our EDI transcripts, our Record Analysts have had a timesavings of approximately 25%.
- Development of a new sense of community, as the Office of Admission's, Registrar's Office, and Information Technology Services cooperated together under a new paradigm – one in which the processes of transcript input and evaluation were accomplished using technology with human oversight, rather than the traditional employment of staff to enter and view the information.
- Increased interest in participating in EDI by the State's community colleges and high schools.

Conclusion

We believe our "Transfer Bridge Project" demonstrates that using EDI you can streamline input and output to legacy systems for student records. The key is the standardization of data and transmission without which none of this would be possible.

However, as the evolution of data transfer happens we encourage all parties to think in terms of the universality of data transmission. We simply cannot fragment how we store, send or receive data. We look with hope to advances that may be brought about using XML. We trust the solid foundation built by EDI transaction sets will serve as the backbone for future enhancements in EDI in the higher education community.

Speaking on a personal level I would be remiss if I did not acknowledge the hard work and countless hours put into our Transfer Bridge Project. It is far too easy for me as a person in the background to underestimate the commitment by several individuals to this project. Therefore I wish to publicly recognize the team of individuals at UNI who made this accomplishment possible.

Deborah Bartels – Admissions Transfer Record Analyst
Joanne Loonan – Assistant Director/Admission Transfer Relations
Kevin Quarnstrom – ITS Information Systems Manager
Mark Renner – Admissions Coordinator
Judy Schultz – ITS Senior Programmer Analyst
Joy Thorson – Admissions Transfer Record Analyst
Mary Westendorf – ITS Systems Analyst

APPENDIX A

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                                                                    10/19/1999


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 800005       SAMPLE, SUSAN                                         10/19/1999
INSTITUTION:  KIRKWOOD COMM COLL              REVIEW ORIG:

--------------------- PREVIOUS INSTITUTIONS ATTENDED --------------------
999999      Z MT MERCY COLLEGE





------------------------- SUMMARY INFORMATION --------------------------
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 T      S    39.00   39.00    39.00    2.650  103.350        4.0




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INSTITUTION:  KIRKWOOD COMM COLL                  REVIEW ORIG:

------------------------  NOTES AND DESCRIPTIONS  ------------------------
BIRTH MONTH/DAY 05/07

STUDENT IS ON SUSPENSION OR DISMISSAL










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   DEPT     COURSE SEC   TITLE              GRD   AHRS   EHRS  SES    T B RS QLF
EP         121T       ENVIRONMENT: NATURAL SC+  D+         3.00 199908 S       01
                                                D+         3.0  19992
EU         300T       PSYCHOLOGY - EDUCATIONAL  W          3.00 199908 S       506
       200 040       EDUCATIONAL PSYCH                     3.0  19992
PA         150T       COLLEGE PHYSICS I         C          3.00 199908 S       01
       880 054       COLLEGE PHYSICS I (+LAB)   C          3.0  19992
HI         130T       EUROPE-AGE OF NATIONALI+  F          3.00 199905 S       01
       960 XXD       EUROPE-AGE OF NATIONALIS   F          3.0  19991









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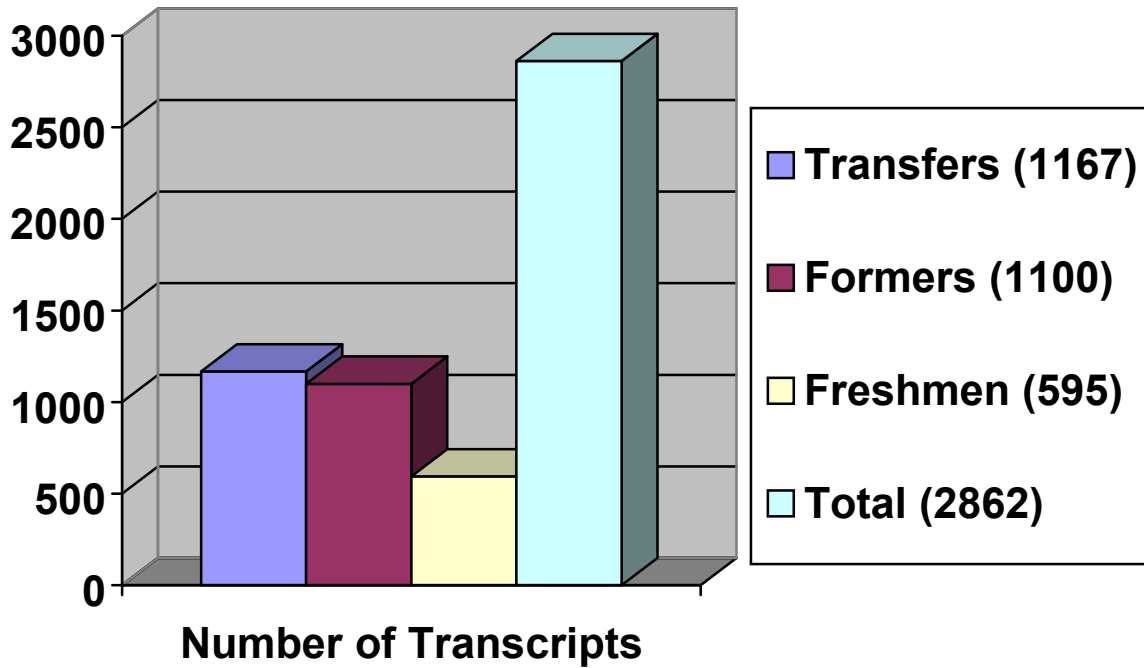
Students With Transfer Credit for Fall 2000

APPENDIX C

SESSION STARTING DATE: 08/1999   1 SEMESTER 1999-00

    COLLEGE OF LIBERAL ARTS

COURSE ID		TITLE	QLF	GRD	AHRS	EHRS	GPTS	TYPE
010	001	RHETORIC I	15	A-		4		S
045	001	AMERICAN VALUES	15	B+		3		S
034	001	INTRO SOCIOL PRINC	15	C+		3		S
004	013	PRINCIPLES CHEM I	15	C+		3		S
000	061	ONLINE AT IOWA	501	S		1		S

SESSION STARTING DATE: 01/2000   2 SEMESTER 1999-00

COURSE ID		TITLE	QLF	GRD	AHRS	EHRS	GPTS	TYPE
006	014	PRIN OF CHEM LAB	15	C		2		S
004	014	PRINCIPLES CHEM II	15	C		3		S
010	002	RHETORIC II	15	C+		4		S
28S	029	JOGGING	501	S		1		S
28S	090	RHYTM BALLRM DANCE	501	S		1		S
28S	094	CUBA STYL LATIN DNC	501	S		1		S
002	010	PRIN BIOLOGY I	506	W		4		S

SESSION STARTING DATE: 08/2000   1 SEMESTER 2000-01

COURSE ID		TITLE	QLF	GRD	AHRS	EHRS	GPTS	TYPE
22M	025	CALCULUS I	15	A-		4		S
088	001	INTERPRETATION LIT	15	B-		3		S
031	001	ELEM PSYCHOLOGY	15	C		3		S
026	033	PHILO & HMN NATURE	15	C+		3		S

OVERALL SUMMARY		TYPE	GPA	QHRS	AHRS	EHRS	GPTS	SUM
UNDERGRADUATE		SEM	2.68	35				
GPA RANGE : 0 - 4								
OVERALL SUMMARY		TYPE	GPA	QHRS	AHRS	EHRS	GPTS	
SUMMARY OF TRANSFER WORK ONLY		SEM		4				
GPA RANGE : 0 - 4								

GRADE SCHEME(S) USED:

    4.0 4.0 3.7 3.3 3.0 2.7 2.3 2.0 1.7 1.3 1.0 0.7 0.0

15 NON-STD SYSTEM USING 5 OR MORE ALPHA GRADES, AND F

501 PASSING GRADE IN A CRSE (CR OR NON-CR) NORMLLY A PASS/FAIL OR SAT/UNSAT DESIGNATION

506 WITHDRAW (WITHOUT PENALTY OR PASS/FAIL DESIGNATION