

# Benchmarks

A green light to greatness.



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## Benchmarks - September, 2014

### Campus Computing News



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By [Claudia Lynch](#), Benchmarks Online Editor

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[Read more](#)

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## By the Numbers

### Down the Corridor of Years

2005

*Benchmarks Online* [publications](#) from 2005 note.

- Oracle and PeopleSoft merged.
- Adobe began offering free online instruction on the use of their products.
- **Dr. Philip Baczewski** was named Director of Academic Computing and User Services January 1, 2005.
- UNT subscribes to TurnItIn.com, a "plagiarism prevention system."
- The State allows UNT to sell surplus property to the general public through direct sales, providing the property is determined to be of no further use to the university.
- **Richard Harris** retired after 42 years of University service and the "[End of an Era](#)" became official.
- Matlab comes to campus.
- A campus RFID interest group was formed.
- **John Hooper**, technical project manager of the EIS implementation, was appointed in July to replace **Coy Hoggard**, who was retiring in August, as Executive Director of Administrative Information Systems: "[The End of an Era II](#)"
- Denton, and UNT [helped evacuees](#) from Hurricanes Katrina and

these areas successful and leave heavy shoes to fill!

[Read more](#)    

## The EDUCAUSE Annual Conference and More



By [Claudia Lynch](#), *Benchmarks Online* Editor

You still have time to register for the EDUCAUSE 2014 Annual Conference, coming up at the end of the month. There is also a virtual Annual Conference, and *EDUCAUSE Live!* webinars remain free and available for viewing at a time of your choosing.

[Read more](#)    

## The Class of 2018



By [Claudia Lynch](#), *Benchmarks Online* Editor

Every August since 1998, Beloit College in Beloit, Wisconsin has released a summary of characteristics typical of incoming freshman. This year's list emphasizes that the Class of 2018, most of them born in 1996, have grown up in a world where content and information have always been free and omnipresent. This has some interesting consequences.

[Read more](#)    

## **Today's Cartoon**

Click on the link above for an information age laugh.



Rita.

- The first issue of the *InHouse* newsletter was published in October.
- A UNT Information Security Handbook for Faculty, Staff and Students was created.
- **Sandy Burke**, Manager of the CITC Helpdesk, retired: [The End of an Era, Final Cut](#)



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As the date of his retirement draws near, John leaves us with these words:

It was with mixed emotions that I submitted my intention to retire as of September 30. The last 23 years have been quite a ride. We all participated in both the incredible expansion of the University as well an explosion of information technology services provided to UNT. We have gone from a single mainframe providing limited services to a complex network of machines providing services to tens of thousands of constituents across the globe. I came here with a kindergartener and a new baby and leave with two adult children that are off and running.

I have lived through 37 years of changing information technology. I have come to realize that today's bright and shiny objects are tomorrow's lumps of coal. Any recitation of accomplishments may seem puzzling to the young so I'll dispense with that. Through all those technological and organizational changes, I value most the memories of the friends and colleagues along the way, both in IT and throughout the University, who partnered, sweated, and dreamed together to make all those things happen. Those memories will be with me long after the technology is forgotten. Our shared commitment, dedication, and vision, combined with a feeling that one was part of an extended family at UNT, made this a great place to be. Although I won't say I'll miss working full time, I will miss all of you that I have come to know as we shared our professional lives and personal stories.

Now it is time for me to get on with the next phase of my life. I am looking forward to traveling, writing, sailing, volunteering, gardening and spending time with my family – especially my wife Terri who has supported me through 37 years of stressful projects, reorganizations, late night calls, and delayed/missed dinners. I can't tell you how many times "it will just be another hour" turned into the wee hours.

I am also very appreciative of all UNT has done for me during my two stints here. I am appreciative of Coy Hoggard who brought me back after I left for 7 years in the 80's. Coy believed in people and empowered us to run with things. I learned a lot about how a university works and information technology's role in it from Maurice Leatherbury. Dr. Rawlins was an inspirational leader and he inspired me with his vision for UNT and his management style. Michael DiPaolo and I partnered in the transition to shared services. Warren Burggren and Yolanda Flores-Niemann have taught me a lot about the academic side of the house and reminded me that at the end of the day it was about the students. I was definitely "standing on the shoulder of giants."

Godspeed to all at UNT.

If reading this makes you a bit nostalgic for "the good 'ol days," take a look at our page dedicated to the [History of Computing at UNT](#). ~ Ed.

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## UIT Web Site gets an Update

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UIT staff spoke to many students, faculty, and staff members on campus during the information gathering phase of our recent strategic planning process. Two recurring themes during those discussions were, "how can I find out what IT services are available at UNT?", and "How can I get help with IT services at UNT?". In response, we have made some changes to the UIT website to better direct people to available IT Services and to the support infrastructures that can provide direct help for those services.

### New starting page

If you've visited the [UIT page](#) previously, you may notice that it now has a much simpler and briefer display of information. Information has been organized into three main categories:

- [About UIT](#)
- [IT Services](#)
- [Getting Help](#)

### University Information Technology (UIT)



UNT University Information Technology (UIT) is tasked to provide effective computing and information technology services to all members of the University community.

Find out...

- [About UIT](#)
- [IT Services at UNT](#)
- [Getting Help with IT Services](#)

Read [Benchmarks](#), the UIT Online News Journal  
Recent [Campus Computing News](#)

Contact the [UIT Help Desk](#)

UIT Staff offices are located in [Sage Hall](#).

Each topic is hopefully self explanatory, but we'll highlight some content of each of these sections here.

### About

The "about" page is where you'll find information about the organization, activities, and history of UIT. If org charts are your interest, this is where you'll find ours.

### Services

A number of resources are available on the UIT IT Services page. The [IT Services Matrix](#) shows which organizations provide different categories of IT services on campus. The [UIT Service Catalog](#) lists the specific services associated with University Information Technology as well as descriptions and contact information for each service category.

## Help!

Sometimes you don't know where to turn for help. This new page on the UIT site will hopefully make it a little easier to find the help and even some training that is available for IT.

## Wrapping it up

We hope that the new organization of the UIT site will help you better find the information you need. You can also search the site but clicking on the "Search" button at the top right of the page and replacing "Search Site" with a word or short phrase. And, if you have suggestions for content you'd like to see on the UIT web site, feel free to e-mail suggestions to [helpdesk@unt.edu](mailto:helpdesk@unt.edu).

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I am privileged to manage Classroom Testing and Desktop Services with the help of my wonderfully trained student workers, Reese Gallagher and Amber Evetts.



*From left to right: IT Manager - Ray Banks, Student Technicians Reese Gallagher, and Amber Evetts*

The testing center is a huge facility where faculty can be sure that their students are testing in a secure environment. By huge facility, we mean, we have 4 rooms in Sage 330 that can hold a total of 136 students at a time! We use advanced assessment and security tools in order to guarantee a secure test. To reserve these classrooms visit <http://it.unt.edu/test>.

The Collaborative technology classrooms are located at discovery park rooms B140, B142, D212, and D215. Each classroom in the B wing features 48 Dell 960 OptiPlex small form factor computers with 19-inch flat panel displays. Upstairs, room D212 is designed just like the first-floor rooms but with only 24 Dell 960's for a more intimate atmosphere. It also features 22-inch LCDs. D215 has 34 20-inch iMacs that are set up in groups in order to encourage group work. These computer classrooms can be reserved for classes through the [Registrar's Office](#) and for testing by contacting [Dr. Elizabeth Hinkle-Turner](#).

## Mobile Testing Center?

We are in the process of implementing a Mobile Testing Center! Instructors that have may not have been fortunate enough to get a spot in the Testing Center to take an exam can allow their students to take their exams in the comfort of their classrooms. Thanks to Dr. Garcia and the Honor's College, we have 20 Dell Netbooks that can deliver the same secured testing environment that the Testing Center provides. Please see our contact information for more details.

## We've come a long way!

When I first came to UNT, I worked in CAS as a student tech assisting the Network Manager with app building with Novell ZenWorks. Yes, I said ZenWorks – don't you miss it? We have made quite a few advancements since then! Machines operated by CTDS are managed through Microsoft SCCM, which provides a quicker turnaround time for instructors and students that have special testing and learning needs. To keep the Windows machines in a consistent and secured environment, we utilize McAfee antivirus, Faronics Deep Freeze and Microsoft Group Policies. For the Macs, we use a combination of DeployStudio, Apple OS X Server, Apple Remote Desktop to provide a high level of uniformity and security.

For more information about Classroom Testing and Desktop Services, please visit our website – <http://it.unt.edu/CTDS>.

## Contact us

Below are convenient ways to reach a live and friendly human being:

### Call us!

(940) 369-6051

If you would like consultation on how we can suit your testing needs, we can be reached Monday through Friday from 8:00AM – 5:00PM. The hours of operation are during the normal academic terms. We may operate different other than posted hours to accommodate the need of student testing, final exams and special events.

### E-mail us!

[CTDS@unt.edu](mailto:CTDS@unt.edu)

Our team strives to be resourceful, quick and diligent. If we are unable to answer your phone call, rest assured that we'll respond to your e-mail in a timely fashion.

### Visit us!

We are located in Sage 154, on the north side of the building and next to the Writing Center. We are also located in Discovery Park B188. Although we are available electronically, we do enjoy visitors too!

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## Network Connection

By [Dr. Philip Baczewski](#), Senior Director of Academic Computing and User Services and Deputy Chief Information Officer for University Information Technology

### Are we Smart Enough for Smart Phones?

[The Atlantic](#) has [reported](#) that, "Ninety-nine percent of people think that privacy is important, but only 52 percent of smartphone users have read the privacy policy of a mobile application." They point out that our smart phones can know our location, contact information, text messages, pictures, friends, eating preferences, favorite games, and favorite web sites. In addition, phones can know what music we like, frequent travel destinations, favorite places to shop, and where we do our banking. But, 34% of The Atlantic's data source would give up beer before ditching their smart phones.

About 15 years ago, I asked the question, "[Are we smart enough for the Internet?](#)" These days you have to wonder if we're smart enough for smart phones. The question is magnified when you consider the concentration of personal information that our smart phones maintain as well as how fast technology is being developed to leverage that information for various commercial and societal purposes.

One example of the power of information is a [research study](#) that used cell phone data to predict crime activity in the city of London. "Predictive policing" is a trend to use past crime activity to predict future activity. When researchers added data that included items like user gender and age, and usage locations for cell phones, their algorithm's predictive capability went from 62% to 68% in successfully identifying future crime "hot spots."

### Tag, you're it.

There's also [news](#) of an App called "[NameTag](#)" that can use facial recognition to compare a photo on your cell phone to photos on dating profile sites or social media sites like LinkedIn and Facebook. NameTag proposes to let you "simply snap a pic of someone you want to connect with and see their entire public online presence in one place." No longer do you have that cumbersome step of looking up their name in Facebook. But this now opens up discovery of identity and information based on just a photo -- this could now be a [Shazam](#) for people.

As if things weren't complicated enough, we now have one company that is pushing content to smart phones before anybody asked for it. Apple provided a "[gift](#)" of the band U2's new album to all of its users' iTunes libraries, only to quickly have to provide a method for letting people [remove](#) that gift from their devices. An article in [Wired](#) points out that Apple imposed data (the album) on an "expensive device" used to "organized and execute" many aspects of people's lives, and further has imposed that data on any backup space that may be used to protect the device. That's one copy on the phone, one in iTunes on the desktop, and one in the backup store times 500 million recipients. That might add up to some significant amounts of device storage. It's the gift that keeps on taking.

Not all is dire in the smart phone world, however. The U.S. Supreme Court, acting in an unusual fit of common sense and constitutional consistency, recently [ruled](#) that police need a warrant in order to search people's cell phones. Apple's new phone OS now features encryption technology that protects data on the device and limits access to phone users who have the unlock code, with no "override" possible by Apple or any service provider. Google's Android technology has had this feature as an option for some time now, but plans are to make it the [default](#) in the next release.

### Protect your smart phone privacy

The Atlantic points out that there are steps you can take to protect your smart phone privacy. These include creating unique and secure passwords, keeping up with phone OS and App updates, reading reviews and ratings to judge the trustworthiness of Apps you download or purchase, being careful and aware as you click on links within Apps, websites, or e-mail messages, noting any alerts that pop up on your phone, and reading the privacy policy for any

Apps you use. I'd add, also note what features on your phone that Apps are accessing and don't use that App if it seems to be needing more access than its function would indicate necessary.

Recently, I've seen advertisements for Internet access in cars. Computerworld [points out](#), "Once mobile devices are connected to car infotainment systems and cars are connected to the Internet, vehicles will become a rich source of data for manufacturers, marketers, insurance providers and the government. Oh, and they'll be a lucrative target for hackers, too." Great. Now we not only have to worry about smart phones, but smart cars as well. And I know for sure from my daily commute, we are definitely not smart enough for cars.

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## Link of the Month

### Planning Implementation

President Neal Smatresk wants *your* feedback. In an email message that was sent to UNT faculty and staff and published in [InHouse](#), Dr. Smatresk discusses the 2014 Planning Implementation Workshop held last month and states:

*We've launched the [Planning Implementation webpage](#) to house all of the great ideas that you and the workshop participants generate and to provide an online forum for your input. You also can read through the top priorities developed by the workshop participants.*

*There are three big questions, which will form the basis for a broad yearlong discussion about making UNT a nationally prominent university. So, please consider and answer:*

- *What is your greatest dream for UNT?*
- *What does the world want from UNT?*
- *What are our unique attributes and market niche?*

*I want to know how you think UNT can improve so that we're providing the best education to our students and offering a supportive, nurturing environment for our students, faculty and staff. I want to know how you think we can be more action-oriented and accountable. I want to know how you think we can become better known and better valued. I also want to know what are your hopes and aspirations for UNT.*

*I hope you'll take the opportunity to share your insight and your vision for UNT. All of this will shape our priorities today and our path tomorrow.*

**Dreams**  
What is your greatest  
dream for UNT?

**World  
Expectations**  
What does the world  
want from UNT?

**UNT's Identity**  
What are our unique  
attributes and market  
niche?

<http://president.unt.edu/planning-implementation>

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## Helpdesk FYI

By [Jacob Flores](#), UIT Support Services Manager

### Campus VPN

The University of North Texas Campus VPN is an interface that will allow you to connect remotely to on-campus resources. This will allow employees and students of the University of North Texas to work from off campus using resources they otherwise could not access. The connection from the user's machine to the Campus VPN is an encrypted connection which allows secure access to resources otherwise unavailable. [x](#)

#### Access the Campus VPN

- Go to <https://vpn.unt.edu/>

You will be prompted to login:

- Enter your EUID and UNT password. If you do not know your EUID and/or password, look [here](#).

- Click the "Login" button.

You will be logged into the Campus VPN.

#### Access a website using the Campus VPN

- Type the URL of the website in the "Address" field.

- Click the "Browse" button.

Your browser window will have a small VPN menu on the top right:



- Click the "Home" button  to go back to the VPN interface.

## Logout of the Campus VPN

- Click the "Logout" icon  on the VPN menu to logout of the Campus VPN.

## Cisco AnyConnect VPN Client

Datacomm provides downloads of the Cisco AnyConnect VPN client, which acts as an alternative to the web based solution described above. This client provides convenience for those using the Campus VPN frequently from the same computer. It does require a computer administrator for installation.

CAS ITS has written very thorough instructions for installing the Cisco VPN client and connecting to the Campus VPN from multiple platforms. That article may be found [here](#). Please contact your Distributed IT Support Group (Netman) for installation assistance. Distributed IT Support Group contact information can be found at <http://helpdesk.unt.edu/netman>.

## Further Documentation

For full documentation of the campus VPN, visit <http://helpdesk.unt.edu/vpn/>.

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\* VPN is an acronym for **V**irtual **P**rivate **N**etwork For more information on VPNs see <http://computer.howstuffworks.com/vpn.htm>.

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# Benchmarks

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## RSS Matters

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# Research and Statistical Support

## University of North Texas

### Factor Analysis with Binary items: A quick review with exa

Link to the last RSS article here: [Call to Create a UNT R Users Group](#). -- Ed.

By [Dr. Jon Starkweather](#), Research and Statistical Support Consultant Team

There have been several clients in recent weeks that have come to us with binary survey data which they would like to factor analyze. The current article was written in order to provide a simple resource for others who may find themselves in a similar situation.

Of course, our professional conscience requires that we mention at the outset; if you are creating a survey (online, paper & pencil, or any other format) you should create the items and response choices in such a way that the responses may be considered interval or ratio; or at the very least, ordinal – not nominal categories and particularly not binary categories. We also feel compelled to advise you against the use of two other types of items. Please do not use any type of contingency or dependent items (e.g. if you answered 'yes' to item 6, go to item 6a; if you answered 'no' to item 6, please move forward to item 7). Also, please do not use any type of multiple response items (e.g. 'choose all those which apply'). If you would like more information on why we make the recommendations above, please consult the substantial literature on survey development (e.g. McDonald, 1999; OECD, 2008, Statistics Canada, 2010).

### Examples

First, import some (simulated) example data. The data used here is available at the URL given in the 'read.table' function below. The data contains eight binary items (x1, x2, x3, x4, x5, x6, x7, & x8) with 1000 cases (i.e. rows) which support two orthogonal factors.

```
df.1 <- read.table(
  "http://www.unt.edu/rss/class/Jon/Benchmarks/BinaryDataFA.txt",
  header = TRUE, sep = ",", na.strings = "NA", dec = ".",
  strip.white = TRUE)
```

```
head(df.1)
  x1 x2 x3 x4 x5 x6 x7 x8
1 0 0 0 0 0 0 0 0
2 0 1 1 1 0 0 0 0
3 0 0 0 0 0 0 0 0
4 0 0 0 0 0 0 0 0
```



```
5 0 0 0 0 0 0 0 0
```

```
6 0 1 0 0 0 0 0 0
```

```
nrow(df.1)
```

```
[1] 1000
```

Notice above, the data is numeric; this is important because if you simply supply this data to a factor analysis function, that function will (by default) calculate the matrix of association assuming those numbers are interval or ratio – which would be incorrect or potentially very biased. Therefore, what is really needed is a way to calculate the correct matrix of association (for the factor analysis) using the appropriate correlation statistic for each pair of variables in our data. Fortunately, the 'polycor' package (Fox, 2014) contains a function called 'hetcor' for doing just that. The 'hetcor' function basically looks at each pair of variables in a data frame and computes the appropriate *heterogeneous correlation* for each pair based on the type of variables which make up each pair. Recall that with categorical variables, the polychoric correlation is appropriate, and the tetrachoric correlation is a special case of the polychoric correlation (for when both variables being correlated are binary). The 'hetcor' function is capable of calculating Pearson correlations (for numeric data), polyserial correlations (for numeric and ordinal data), and polychoric correlations (for ordered or non-ordered factors) – from a single data frame with all of the above mentioned types of variables.

So, because the data is imported as numeric, we must first recode it as factor (i.e. categorical); which can be done very easily using the 'sapply' function. There are other packages and functions which allow more precise control over recoding variables; such as the 'recode' function in the 'car' package (Fox, et al., 2014).

```
df.2 <- sapply(df.1, as.factor)
```

```
head(df.2)
```

```
  x1 x2 x3 x4 x5 x6 x7 x8
```

```
[1,] "0" "0" "0" "0" "0" "0" "0" "0"
```

```
[2,] "0" "1" "1" "1" "0" "0" "0" "0"
```

```
[3,] "0" "0" "0" "0" "0" "0" "0" "0"
```

```
[4,] "0" "0" "0" "0" "0" "0" "0" "0"
```

```
[5,] "0" "0" "0" "0" "0" "0" "0" "0"
```

```
[6,] "0" "1" "0" "0" "0" "0" "0" "0"
```

Once the *numeric* data have been recoded *as factor*, we can proceed by loading the 'polycor' package which contains the 'hetcor' function.

```
library(polycor)
```

```
Loading required package: mvtnorm
```

```
Loading required package: sfsmisc
```

Now we can compute the appropriate correlation matrix and assign that matrix to a new object (het.mat). Notice below, we are extracting only the correlation matrix (\$cor) from the output of the 'hetcor' function.

```
het.mat <- hetcor(df.2)$cor
```

```
Warning messages:
```

```
1: In polychor(x, y, ML = ML, std.err = std.err) :
```

```
  inadmissible correlation set to 1
```

```
2: In hetcor.data.frame(dframe, ML = ML, std.err = std.err, bins = bins, :
```

```
  the correlation matrix has been adjusted to make it positive-definite
```

```
het.mat
```

```
  x1    x2    x3    x4    x5
```

```
x1 1.000000000 0.910975550 0.844483311 0.691731074 -0.002245134
```

```
x2 0.910975550 1.000000000 0.859541108 0.808750265 0.037625262
```

```
x3 0.844483311 0.859541108 1.000000000 0.723304581 -0.026716610
```

```
x4 0.691731074 0.808750265 0.723304581 1.000000000 -0.001185206
```

```
x5 -0.002245134 0.037625262 -0.026716610 -0.001185206 1.000000000
```

```
x6 -0.039424602 -0.004851113 -0.046661991 -0.001214029 0.993573475
```

```

x7 0.002335945 0.005438252 -0.014930707 -0.009831874 0.879110898
x8 -0.036916591 -0.054512229 0.006043798 0.031313650 0.794959194
      x6      x7      x8
x1 -0.039424602 0.002335945 -0.036916591
x2 -0.004851113 0.005438252 -0.054512229
x3 -0.046661991 -0.014930707 0.006043798
x4 -0.001214029 -0.009831874 0.031313650
x5 0.993573475 0.879110898 0.794959194
x6 1.000000000 0.849171046 0.781588616
x7 0.849171046 1.000000000 0.703973732
x8 0.781588616 0.703973732 1.000000000

```

Although there are two warnings listed above, the function does in fact return the appropriate correlation matrix. Now we can proceed with the factor analysis using this 'het.mat' correlation matrix as the matrix of association for the factor analysis.

```
fa.1 <- factanal(covmat = het.mat, factors = 2, rotation = "varimax")
```

```
fa.1
```

```
Call:
```

```
factanal(factors = 2, covmat = het.mat, rotation = "varimax")
```

```
Uniquenesses:
```

```

      x1  x2  x3  x4  x5  x6  x7  x8
0.164 0.005 0.252 0.345 0.005 0.008 0.243 0.368

```

```
Loadings:
```

```

      Factor1 Factor2
x1      0.913
x2      0.997
x3      0.863
x4      0.809
x5 0.997
x6 0.996
x7 0.870
x8 0.794

```

```
      Factor1 Factor2
```

```
SS loadings    3.378  3.232
```

```
Proportion Var 0.422  0.404
```

```
Cumulative Var 0.422  0.826
```

```
The degrees of freedom for the model is 13 and the fit was 12.2084
```

Another equally effective way to factor analyze binary data (or any other type of data), using a correlation matrix, is with the 'fa' function from the 'psych' package (Revelle, 2014). Again, we use the correlation matrix we generated with the 'hetcor' function. Please note, the default method of extraction for the 'fa' function is minimum residuals (method = minres) and not maximum likelihood (method = ml).

```
library(psych)
```

```
fa.2 <- fa(r = het.mat, nfactors = 2, n.obs = nrow(df.2), rotate = "varimax")
```

```
Loading required package: MASS
```

```
Loading required package: GPArotation
```

```
Loading required package: parallel
```

```
fa.2
```

Factor Analysis using method = minres

Call: fa(r = het.mat, nfactors = 2, n.obs = nrow(df.2), rotate = "varimax")

Standardized loadings (pattern matrix) based upon correlation matrix

	MR1	MR2	h2	u2	com
x1	-0.11	0.93	0.87	0.128	1
x2	-0.09	0.96	0.94	0.062	1
x3	-0.11	0.92	0.86	0.141	1
x4	-0.07	0.86	0.75	0.250	1
x5	0.98	0.10	0.96	0.036	1
x6	0.97	0.08	0.94	0.058	1
x7	0.91	0.09	0.84	0.160	1
x8	0.87	0.07	0.76	0.242	1

	MR1	MR2
SS loadings	3.51	3.41
Proportion Var	0.44	0.43
Cumulative Var	0.44	0.87
Proportion Explained	0.51	0.49
Cumulative Proportion	0.51	1.00

Mean item complexity = 1

Test of the hypothesis that 2 factors are sufficient.

The degrees of freedom for the null model are 28 and the objective function was 23.3 with Chi Square of 23199.31

The degrees of freedom for the model are 13 and the objective function was 13.77

The root mean square of the residuals (RMSR) is 0.04

The df corrected root mean square of the residuals is 0.06

The harmonic number of observations is 1000 with the empirical chi square 99.24 with prob < 2.3e-15

The total number of observations was 1000 with MLE Chi Square = 13694.45 with prob < 0

Tucker Lewis Index of factoring reliability = -0.273

RMSEA index = 1.029 and the 90 % confidence intervals are 1.011 1.04

BIC = 13604.65

Fit based upon off diagonal values = 0.99

Measures of factor score adequacy

	MR1	MR2
Correlation of scores with factors	1	1
Multiple R square of scores with factors	1	1
Minimum correlation of possible factor scores	1	1

## Conclusions

As demonstrated above, using binary data for factor analysis in R is no more difficult than using continuous data for factor analysis in R. Although not demonstrated here, if one has polytomous and other types of mixed variables one wants to factor analyze, one can also use the 'hetcor' function (i.e. heterogeneous correlations) located in the 'polycor' package (Fox, 2014). More extensive examples of the use of the 'hetcor' function are available at the RSS [Do-it-yourself Introduction to R](#) course page where many other examples (not just factor analysis) are provided. Lastly, a copy of the script file used for the above examples is available [here](#).

Until next time; remember what George Carlin said: *"inside every cynical person, there is a disappointed idealist."*

## References / Resources

Carlin, G. (1937 – 2008). <http://www.just-one-liners.com/ppl/george-carlin>

Fox, J. (2014). The 'polycor' package. Documentation available at CRAN: <http://cran.r-project.org/web/packages/polycor/index.html>

Fox, J., et al. (2014). The 'car' package. Documentation available at CRAN: <http://cran.r-project.org/web/packages/car/index.html>

McDonald, R. P. (1999). *Test Theory: A Unified Treatment*. Mahwah, NJ: Erlbaum.

Organization for Economic Co-operation and Development (OECD). (2008). *Handbook on Constructing Composite Indicators*. <http://www.oecd.org/std/42495745.pdf>

Revelle, W. (2014). The 'psych' package. Documentation available at CRAN: <http://cran.r-project.org/web/packages/psych/index.html>

Statistics Canada. (2010). *Survey Methods and Practices*. Ottawa, Canada: Minister of Industry. <http://www.statcan.gc.ca/bsolc/olc-cel/olc-cel?lang=eng&catno=12-587-X>

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## Training

By [Claudia Lynch](#), *Benchmarks Online* Editor

Do you need training on widely used computer programs including those used in statistical analysis? If so, this monthly *Benchmarks Online* column is for you.

### Statistical Analysis

Instructor-led courses are offered only by special request. Please contact an [RSS member](#) or [Claudia Lynch](#) if you are interested in taking such a class or wish to have someone offer a class for your students. [SAS](#), [SPSS](#) and [Introduction to R](#) are offered online. Make sure and check out the **RSS Matters** article [Statistical Resources](#) in the July 2012 issue of *Benchmarks Online*.


**Special classes** can always be arranged with the RSS staff. Also, you can **always** contact the RSS staff for one-on-one [consultation](#). Please read the [FAQ](#) before requesting an appointment though.

### Especially for Faculty and Staff Members

In addition to the online statistical courses, which are available to students, faculty, and staff, staff and faculty members can take courses offered through the [Business Service Center](#) (they have a new comprehensive training curriculum), and the [Center for Learning Enhancement, Assessment, and Redesign](#) (CLEAR). Additionally, the [Center for Achievement and Lifelong Learning](#) (CALL) offers a variety of courses, usually for a small fee.

### UNT System Training Resources

Visit [my.unt.edu](#) and login to access tutorials.

 UNTS Training

### University of North Texas System (UNTS) Training

These tutorials provide a place to learn and practice key processes in a simulated environment. First time users should view the [User Productivity Kit \(UPK\) player introduction](#) before proceeding.

All Faculty & Staff

Supervisors & Administrative Staff

Additional Training Resources

## Microsoft Virtual Academy

### Who is eligible to participate in MVA?

- Anybody interested in growing their career can be a part of MVA.
- To sign up for MVA , on the [MVA home page](#), MVA courses and events are free, but you need to identify yourself using a Microsoft account in order to sign up for MVA and create your MVA profile.
- There is no minimum level of technical expertise required.

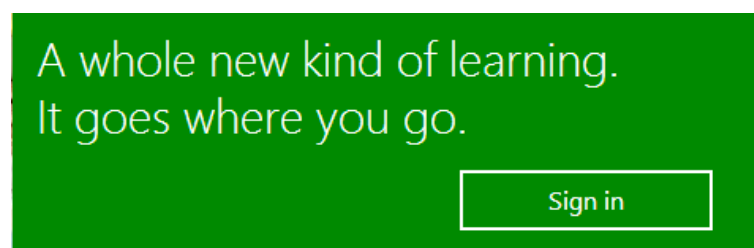
## Microsoft E-Learning

Microsoft E-Learning courses are available for faculty, staff, and students via our UNT System Microsoft Campus Agreement. ***Instructions for accessing Microsoft E-Learning have recently changed.***

Follow the instructions below to access E-learning until you arrive on the "UNT System authenticated service Page."

- Go to: <https://onlinelearning.microsoft.com>

- Click **Sign In**:



- Then choose:



### Organizational account

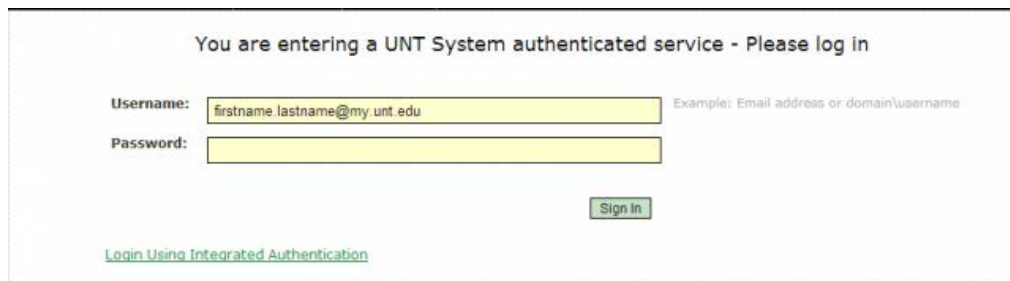
Sign in with the account provided by your work or school to use with Office 365 or other Microsoft services.

- 
- You will be taken to the following sign in page:

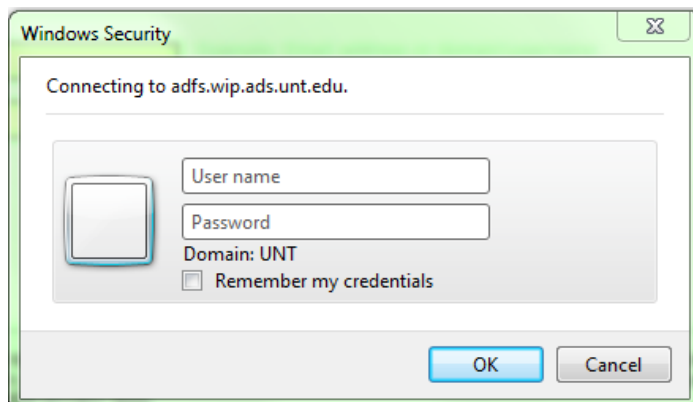
Sign in with your organizational account

someone@example.com

- 
- Fill in your UNT email address on the sign in page and press the "Sign In" tab.
- You will be taken to the UNT System authenticated service Page:



- To login using **Integrated Authentication**, click on that link and type **UNT\EUID** where **EUID** is *your* EUID. This should take you to the UNT courses that are available. If you are using Internet Explorer the following box will appear and you should enter your EUID where it says "Username."



- Once signed in, you should be able to access the courses that are available to the UNT community.
- You can access courses available to the general public by choosing the Microsoft Account option:



**Microsoft account**

Sign in with the account you use for OneDrive, Xbox Live, Outlook.com or other Microsoft Services.

- If you do not currently have a Microsoft account (previously called a "Live ID") you can create one at Microsoft's [Live Sign-up site](#).

## Microsoft E-books

Click on the link and access the largest collection of [FREE Microsoft eBooks](#) ever, including: Windows 8.1, Windows 8, Windows 7, Office 2013, Office 365, Office 2010, SharePoint 2013, Dynamics CRM, PowerShell, Exchange Server, Lync 2013, System Center, Azure, Cloud, SQL Server, and much more!



## Central Web Support

Central Web Support [provides](#) "web hosting and support to appropriate campus entities free of charge." Visit their [website](#) for "How-Tos about Everything."

## CLEAR

CLEAR offers courses especially for Faculty Members. *CLEAR training includes:*

- Blackboard

- Turnitin
- Turning Point
- Assessment
- Teaching Effectiveness
- Respondus

Please check out CLEAR's training and event calendar at <http://clear.unt.edu/calendar> for the latest information regarding Blackboard, CLEAR's initiatives, and on campus instructional events.

Further information can be found [here](#).

### **FREE Online Learning Consortium Workshops**

The University of North Texas is a premium member of the Online Learning Consortium (formerly the Sloan Consortium) College Pass. To request FREE ENROLLMENT in an Online Learning Consortium workshop, please contact [Amber Bryant](#) with the name and date of the workshop selected.

- [Online Consortium 2014 Workshops](#)

*Please click on the link above to see the available 2014 workshops.*

## **Ed2go**

Ed2go are courses that are offered, for a fee, to UNT faculty, staff and students as well as the general public. According to the CALL [website](#):

*CALL has partnered up to provide online learning on a variety of topics. From standardized test preparation to database programming to training for libraries and their staff, there's a variety of areas from which to choose in online learning.*

*The online minicourses, provided in conjunction with Ed2go, are standardized 12-lesson modules released over a six week period. (Courses are active for eight weeks to provide some flexibility). Each module features a quiz. Lessons are instructor-led and course participants and instructor communicate through a course discussion board. Lessons can be downloaded and saved. At the end of the course there is a final quiz. A passing grade opens a window that allows students to print out a course completion certificate.*

*Most courses are \$89, and UNT faculty, staff and students may receive a \$10 discount. Visit the online courses page at <http://www.ed2go.com/unt/> or contact Tami Russell at 940.565.3353 for more information.*

For additional information, visit the **Ed2go blog** [here](#). You can [subscribe to their newsletter](#) also.

## **Information Security Awareness**

Information Security Awareness -- The ITSS Information Security team offers Information Security Awareness training to all UNT faculty and staff.

- It is a policy requirement that ALL staff take an information security course at least once a year.
- See the [Virus Information Page](#) and the [Information Security Handbook -- for Faculty, Staff and Students](#) for further information.

## **UNT HR Training and Development**

As noted on their [website](#):

*Monthly emails are sent to all employees with a list of current classes, many available by webcast. (Note: Few, if any classes are offered during the winter break, spring break holiday periods for all UNT System campuses.)*



Learn more about classes

here: [https://untranet.unt.edu/untsystem/UNT%20System%20HR/talent\\_management/SitePages/Home.aspx](https://untranet.unt.edu/untsystem/UNT%20System%20HR/talent_management/SitePages/Home.aspx)

If you have questions or specific needs, contact [talentmanagement@untsystem.edu](mailto:talentmanagement@untsystem.edu) or call 855-878-7650 to be directed to a Talent Management staff member.

## Alternate Forms of Training

Many of the General Access Labs around campus have tutorials installed on their computers.

See <http://computerlabs.unt.edu/> for a list of labs and their locations. The 24 Center in Willis Library, for example, has a [list of Tutorials and Software Support](#). The Library Instructional Unit also offers workshops and training, including "tech skills" training. Visit their websites for more information: <http://www.library.unt.edu/library-instruction>.

## Info~Tech, UNT's IT Research Partner

Info~Tech is UNT's IT research partner. UNT System, UNT, UNT Health Science Center and UNT Dallas employees have access to Info~Tech research at: [www.infotech.unt.edu](http://www.infotech.unt.edu) (click on the UNT System name to login). Your standard EUID and Password gains you access to the Info~Tech system. Please take a moment to read their terms and conditions by clicking through the agreement when you set up your profile the first time you log in.

## State of Texas Department of Information Resources

Another possible source of training for staff and, perhaps, faculty members is the Texas Department of Information Resources. A look at their Education and Training [website](#) reveals some interesting possibilities.

## New Horizons Computer Learning Centers

New Horizons is a DIR vendor, which means that state agencies, like UNT, get special pricing for their services negotiated at the State level (click [here](#) for more information about DIR vendors). [New Horizons](#) offers courses at their own facilities in Dallas and Fort Worth, but will arrange for onsite training as well. They have a "Tips and Tricks" [page](#) that has helpful information. You can also [join their mailing list](#) to receive their monthly newsletter, event invitations and specials.

## EDUCAUSE Live! Webinars

**EDUCAUSE Live!** is a series of **free**, hour-long interactive webinars on critical information technology topics in higher education. You can [register](#) for upcoming webinars and you can find recordings of **all past webinars** in the [EDUCAUSE Live! archives](#).

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## Staff Activities

Staff activities for [UIT](#) are reported in this column.

### Changes, Awards, Recognition, Publications, etc.

- **Aaron Powers** was promoted from IT Specialist I, Business Services (AITS) to IT Manager I, Administrative Departments/Health Center/ACUS (AITS).
- **Daniel Wiersema** was promoted from IT Specialist II, Administrative Departments (AITS) to IT Specialist IV for ACUS (AITS).

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## The EDUCAUSE Annual Conference and More

By [Claudia Lynch](#), *Benchmarks Online* Editor

You still have time to register for the EDUCAUSE 2014 Annual Conference, coming up at the end of the month. There is also a virtual Annual Conference, and *EDUCAUSE Live!* webinars remain free and available for viewing at a time of your choosing.



**EDUCAUSE 2014**  
ANNUAL CONFERENCE

September 29–October 2, 2014 | Orlando, Florida and Online

### General Session Speakers



**Clay  
Christensen**

Kim B. Clark Professor of  
Business Administration,  
Harvard Business School



**Doris  
Kearns Goodwin**

Presidential Historian and  
Pulitzer Prize-Winning  
Author



**Nancy  
Zimpher**

Chancellor,  
The State University  
of New York



### Key Upcoming Dates

- Early Bird Discount Deadlines:  
*Face-to-face:* **September 2**  
*Virtual:* **September 23**

Click on the link for more information: <http://www.educause.edu/annual-conference>

## Virtual Conference

- Start Date: **Tuesday, September 30**
- Start Time: **7:30 a.m.** (UTC-4)
- Conference End Date: **Thursday, October 2**
- End Time: **11:30 a.m.** (UTC-4)
- Preconference Seminars: **Monday, September 29** (for additional fees)

Click on the link for more information: <http://www.educause.edu/annual-conference/virtual-conference>

## EDUCAUSE LiveWebinars

**EDUCAUSE Live!** is a series of **free**, hour-long interactive webinars on critical information technology topics in higher education. You can [register](#) for upcoming webinars and you can find recordings of **all past webinars** in the [EDUCAUSE Live!archives](#).

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# Benchmarks

A green light to greatness.



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## The Class of 2018

By [Claudia Lynch](#), *Benchmarks Online* Editor

Every August since 1998, Beloit College in Beloit, Wisconsin has released a summary of characteristics typical of incoming freshman. This year's list emphasizes that the Class of 2018, most of them born in 1996, have grown up in a world where content and information have always been free and omnipresent. This has some interesting consequences.

The introduction to this year's list reads:

*Students heading into their first year of college this year were generally born in 1996.*

*Among those who have never been alive in their lifetime are Tupac Shakur, JonBenet Ramsey, Carl Sagan, and Tiny Tim.*

*On Parents' Weekend, they may want to watch out in case Madonna shows up to see daughter Lourdes Maria Ciccone Leon or Sylvester Stallone comes to see daughter Sophia.*

Find the rest of the list here:

<http://www.beloit.edu/mindset/2018/>

You can also [view a podcast](#) about the list.

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### More information

What am I?

**Generation Z:** Also known as Post Millennials, Digital Natives or Plurals. These young people were typically born after 1995, in about 2000 or 2001. They are described as an emerging generation that is well-connected to technology, very diverse and driven to help others. Experts said the shared experiences of this generation are still being defined.

**Millennials:** This generation is also called Generation Y or Echo Boomers. They are largely the children of baby boomers. Some experts say they were born in 1976-94, and others say they were born in 1982-2000. Their shared experiences include the Oklahoma City bombing in 1995, the Columbine High School massacre, 9-11 and the advancement of the Internet and technology.

**Generation X:** Also referred to as the MTV Generation or Slackers. This generation was typically born in 1965-80. Shared experiences that helped shape this generation are the Iran hostage crisis, the Persian Gulf War, the fall of the Berlin Wall, the AIDS epidemic, the shuttle Challenger explosion, high divorce rates and personal computers.

**Baby boomers:** These people are often described as being born in 1946-64. After World War II, the nation experienced a Baby Boom largely because couples could begin to start families after the conflict. This generation shared events such as the Kennedy assassination, the Vietnam War, Watergate and the civil-rights movement.

**The Silent Generation:** These people are also called the Greatest Generation. Their shared experiences are the Great Depression, the Dust Bowl and Pearl Harbor.

Sources: Melanie McGee, director for corporate relations for the University of Texas at Arlington's Business College; and [www.history.com](http://www.history.com) Read more [here](#).



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## Today's Cartoon

© Randy Glasbergen  
glasbergen.com



**"I prefer to read the news on my phone. The little screen makes the world's problems look smaller."**

From "Today's Cartoon by Randy Glasbergen", posted with special permission.  
For many more cartoons, please visit [www.glasbergen.com](http://www.glasbergen.com).

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