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# **Using Universal Design for Learning in Community & Technical Colleges**

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*Renton Technical College*

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*This publication including introductions to assistive technologies and closed caption video clips of interviews with administrators, counselors, instructors and students is available on CD upon request. See page fourteen for Contact Information.*

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## What is Universal Design for Learning?

Universal Design for Learning (UDL) is a paradigm, based on brain research, which promotes providing increased accessibility for *all* students, not just those with documented disabilities.

It encourages the use of **flexible methods and resources**, emphasizing **multi-modal strategies** and using research on **how the brain learns** in order to meet the needs of different types of learners.

From the CAST.org website, these three principles are the foundation of UDL:

1. To support recognition learning, provide multiple, **flexible methods** of presentation
2. To support strategic learning, provide multiple, **flexible methods** of expression and apprenticeship.
3. To support affective learning, provide multiple, **flexible** options for **engagement**.



This “open door approach” helps students who are undiagnosed or who don’t want to be singled out as disabled, or who have learning problems that are not severe enough to be considered a disability but still impede their success in the classroom.

Universal Design began in architecture and product development where the goal was to make systems, structures and products “user-friendly” to as many different people as possible.

For more information on Universal Design and Universal Design for Learning, see the following websites:

The Center for Applied Special Technology at [www.CAST.org](http://www.CAST.org)

The University of Washington’s DO IT program at <http://www.washington.edu/doit/Faculty/Strategies/Universal/>

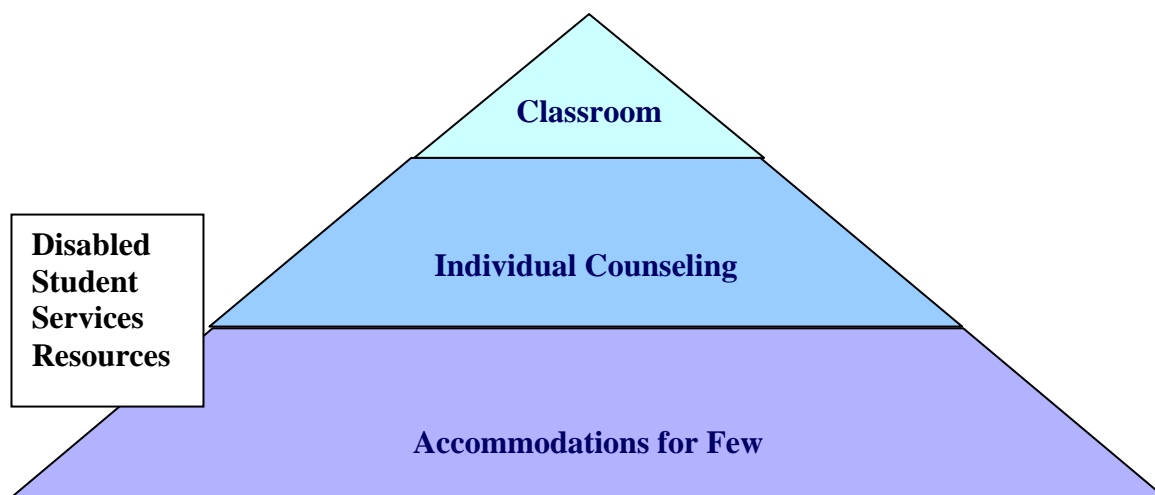
The Department of Education at <http://www.ed.gov/about/offices/list/ovae/pi/AdultEd/disaccess.html>

## How Does it Change Things?

At Renton Technical College, we began a **pilot project** using UDL in 2002, after receiving a grant from the Department of Education. Through our involvement in the Washington State Board for Community and Technical College's Learning Disabilities Quality Initiative (LDQI), we had discovered that as an institution we had many more students with learning disabilities (LD) and learning challenges than we were aware of. Some of our instructors wondered if these students might be dropping out or struggling unduly because they either didn't know they had a learning disability, didn't want to disclose it or possibly had a learning challenge that was significant but not enough for a formal diagnosis of LD.

This led us to consider UDL and how it might change the way we help our students.

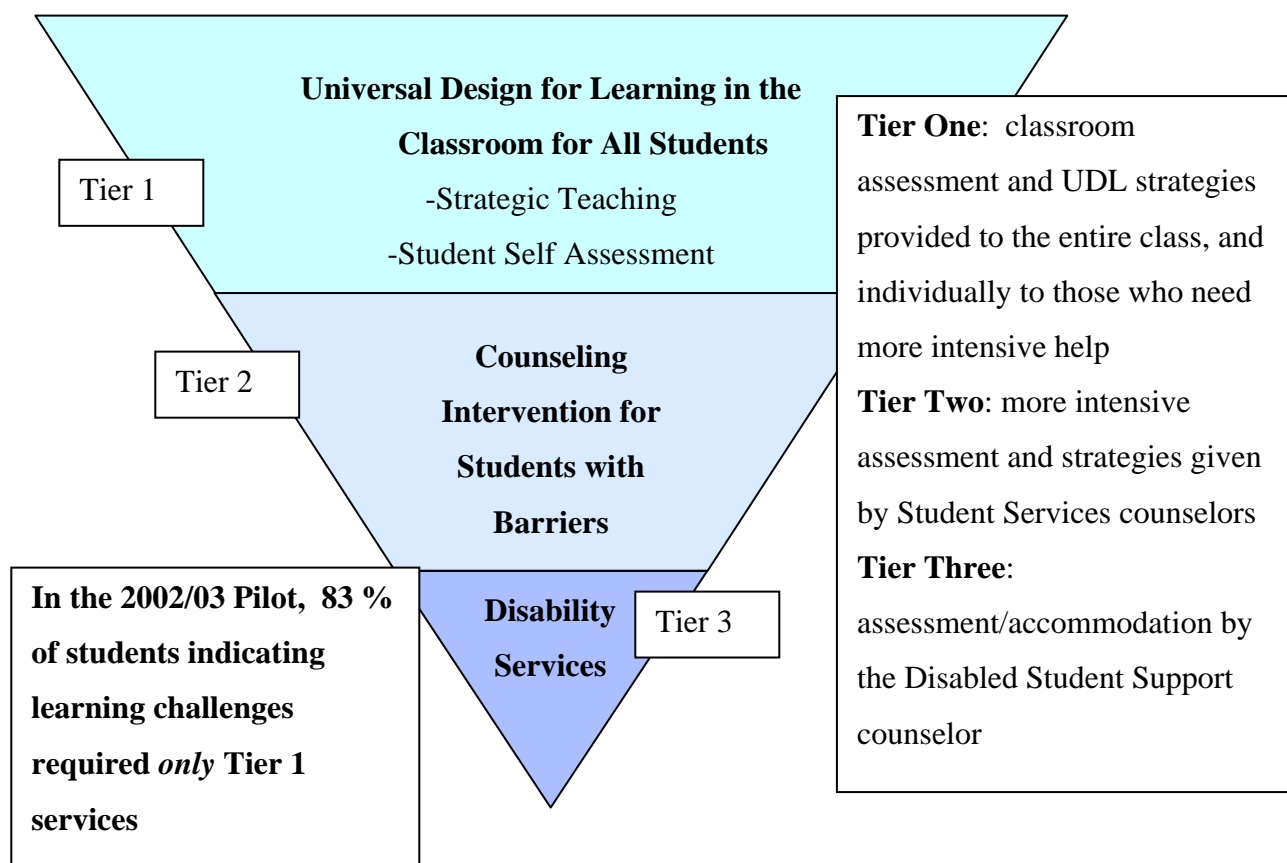
Following is a chart which represents how resources are given to students with disabilities on most college campuses. It represented our campus in 2002:



***Most resources go to a few students who have documented disabilities.*** Some resources go to students who need assessment, counseling and referral, and even fewer resources go directly into the classroom for students with moderate but still problematic learning issues. Often it takes weeks, possibly even months, for a student to either disclose a disability or be recognized as having a severe learning challenge and be referred to the Disabled Student Services (DSS) Counselor. During this interval, valuable teaching and learning time may be lost! In addition, we found at RTC that our instructors were often nervous about how to handle students with disabilities and their accommodations. They were often uncertain about what they could say or do to help these students. This can result in less assistance in the classroom where the student spends the bulk of his or her time!

**Using UDL helped us turn this model upside down!** By training instructors and counselors about UDL and how to apply it, much more assistance for students with disabilities is happening in the classroom –whether or not the student is diagnosed or disclosed! With the model described below, many resources are available to ALL students in the classroom. Instructors are also trained on how to try out individualized strategies for students who may need a little more help. They are given more information on how to make effective referrals to the Student Services department for more intensive help. At RTC, we call this process the **Learning Assessment System**.

### LEARNING ASSESSMENT SYSTEM



### How Does it Work in the Classroom?

Instructors use UDL principles to increase accessibility in their classrooms. They try to make sure that they are teaching in ways that include all modalities: visual, auditory and kinesthetic. They also try to take strategies shown to be helpful for students with disabilities and offer them to all students in their classes.



Most instructors report that while it takes some time and effort at the start of using UDL to change their teaching formats and add strategies, the pay-off is worth it. It quickly becomes easier and easier to add strategies after the first changes are made.

***Many instructors also reported that they were intuitively using strategies, but didn't always understand why.***

Understanding why the strategies work (the brain studies and research behind them) makes it much easier to make changes and/or add new strategies!

Strategies come in all varieties, from low tech like using highlighters to very high tech software programs. At the end of this document, we will highlight some of the most common and helpful strategies for the college classroom, based on our experience.

## **Does it Replace the Disabled Student Service Office?**

One of the most frequent questions counselors and administrators ask when considering using UDL, is “how will it impact the Disabled Student Services office?” At RTC, the DSS counselor works very closely with staff from the Instructional Improvement department to help instructors and students gain the most benefit from UDL strategies and classroom accommodations. ***Accommodations, interventions and recommendations for students with disabilities are the purview of the DSS counselor.***

UDL allows instructors to offer strategies to the entire class without worrying about disclosing of disabilities. However, if an instructor is told about a disability or has concerns, he or she should contact the DSS office for individualized help right away! ***UDL does not take the place of accommodation or assessment!***

What we have found at RTC is that UDL augments the services the DSS counselor puts in place. It also helps instructors be more flexible and open minded about accessibility and trying new teaching methods.

## **Learning Strategies: Low Tech**

Instructors are encouraged to try a variety of UDL learning strategies in their classrooms, both low and high tech. Although high-tech solutions such as sophisticated computer programs or tools are often attractive, ***most instructors recognize that low tech strategies often have the greatest benefit.*** They are usually the quickest to learn, most portable and often students can employ them



easily at home or in other non-school environments. Each instructor in the Pilot was given an “Instructor Tool Kit” based on the work of Judy Campbell from the Institute of Extended Learning in Spokane. This toolkit includes items such as rulers for masking, colored overlays, magnifier bars and pages, reading glasses, flip cards, highlighters and sticky notes. Students are encouraged to make use of these low tech tools when learning.

Another common low tech strategy is teaching students how to organize. ***Lack of organizational skills is the number one concern for most students with learning disabilities.*** With UDL, rather than just helping the LD student, the instructor offers organizational skills training and tools to the entire class. This can range from a sophisticated expanded or digitized syllabus to something as simple as showing students how to organize a binder and giving out handouts with holes already punched.

Following is a list of some tried and true LOW TECH learning strategies for the college classroom:

◆ **David Sousa’s “Prime Time-Down Time” Teaching Intervals**—from How the Brain Learns, Corwin Press, 2001 suggest a specific rhythm to learning:

- Prime Time: about 20 minutes –new information can be absorbed.
- Down Time: about 10 minutes -student can’t take in new information (very little retention occurs) but can process information.
- Prime Time 2: About 10 minutes-students can learn new information again (integration of old and new)



◆ **Guided Notes for Lecture**--Research shows that this strategy enhances lecture retention by cueing students to main ideas and organization of information. It also helps students who have difficulties taking notes while listening to lectures.

<http://telr.osu.edu/dpg/fastfact/fastfactcolor/GuidedNotes.pdf>

◆ **Paraphrasing**--This strategy helps with reading comprehension. Students read a paragraph, ask themselves questions about the main idea and details. For more information, see the iStart model from the University of Memphis.

<http://csep.psyc.memphis.edu/istart/strat.htm>

◆ **PASS**- This strategy also helps with reading comprehension. PASS is an acronym that stands for:

- Preview, review and predict
- Ask and answer questions
- Summarize
- Synthesize



◆ **Mnemonics**—this is a system for using linking of meaningful sounds or words to create an association that will foster retention and recall. Find more information at LDonline.org at <http://www.ldonline.org/article/5912>

◆ **POWER**—This is a strategy for writing based on an acronym that helps students to use visual organizing and remediation to write:

Plan your paper

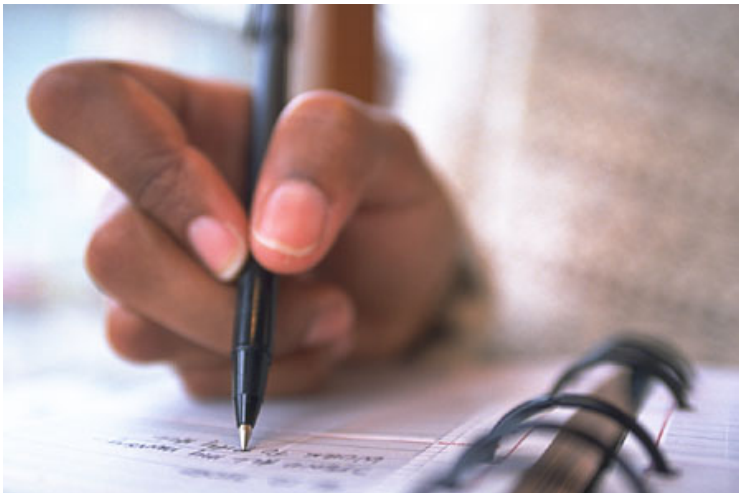
Organize thoughts and ideas (using a graph)

Write your draft

Edit your work

Revise and produce a final draft

More information can be found at LDonline.org at <http://www.ldonline.org/article/5890>



◆ **Two Column Note Taking** – This strategy helps students with taking notes and comprehending lectures. Students are taught to divide their paper into two columns (one large, one smaller) Main ideas are located in the smaller left side and details on the larger right side.

[www.byu.edu/cc/learning/note-tak.php](http://www.byu.edu/cc/learning/note-tak.php)

◆ **Three Column Note Taking--**  
Similar to Cornell Two Column Note

taking for lecture, this strategy works best for math notes. The paper is divided into three columns, one for keywords, one for examples and one for the rules that accompany the problem. More information can be found at:

<http://www.isu.edu/ctl/math/study-strat.html>.

There is also a short video clip on the RTC UDL project website illustrating the three column math technique in one of our Basic Skills classrooms. To see it, click on DeEtta Ryan's video at this site: <http://webs.rtc.edu/ii/dsdp.html>

## High Tech Strategies

High tech strategies typically involve the use of computers or other electronic tools to **augment lecture by using visual images or activities, or to “capture” visual or auditory information so that students can review it later.**

Projecting a PowerPoint presentation, pictures or internet information via an LCD projector is one of the easiest and most effective ways of enhancing a lecture.

**All video clips mentioned in this section can be viewed through the UDL project website at <http://webs.rtc.edu/ii/dsdp.html>**

At RTC, one of the most popular high tech UDL teaching strategy is the use of an interactive white board. These whiteboards function just like traditional whiteboards when not turned on but when activated and connected to a computer and LCD projector, they run the computer from the board, allow anything written on the board to be captured into the computer, play back sequences of board notes and allow annotation with projected pens of different colors, patterns and sizes. This link will take you to a short video clip of an instructor at RTC, Mike Biell, using an electronic whiteboard to show students how to use a shared calendar for assignments. <http://webs.rtc.edu/ii/DSDP%20Grant/%20Mike%20Biell-Close%20Caption%20Final.wmv>

Another favorite high tech tool is the digital magnifier which allows documents or objects to be digitized (captured into a computer) magnified and shown on a large screen through a LCD projector. Here is a short video clip of Jack Devine, ITEC instructor, demonstrating a digital magnifier:

[http://webs.rtc.edu/ii/DSDP%20Grant/Jack%20Devines%20close%20caption%20final\\_0001.wmv](http://webs.rtc.edu/ii/DSDP%20Grant/Jack%20Devines%20close%20caption%20final_0001.wmv)

Tablet PC's, Digital magnifiers, Hitachi Starboards, Polyvision Whiteboards, Mimios and Smartboards are all examples of tools which can be used in conjunction with an LCD projector to enhance learning. These tools create a multi-modal learning environment (visual, auditory and kinesthetic) by allowing the student to see the information on the board, hear the lecture or audio replay and also to annotate the board notes or computer projection. Because the board notes are digitized, the annotations and changes can be saved and played back later




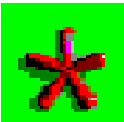




The UDL project discovered that instructors need to find the “right” technology that works with their teaching style. For instance, some technologies- i.e. the Tablet PC, restrict the instructor’s movements in the classroom. The instructor must be by the computer to make the visual presentation appear on the screen. Other tools- i.e. electronic whiteboard and Mimio- allow the instructor to move around and write on a large whiteboard area. Instructors who need to show small parts or other student’s papers may get more benefit out of the digital magnifier. To solve this problem of right fit of technology, RTC invested in a **Multi Modal Teaching Technology Lending Bank**. Instructors get to borrow these tools and use them in their classrooms for a few weeks to find the one that works best for their teaching style and content area.


This one-time investment makes the final purchase must less risky for instructors or departments. For the instructor who knows he or she is only going to use the technology periodically, it is available free of charge in the Lending Bank!

## Assistive Technology

Other high tech strategies involve the use of technologies traditionally thought of as only being for students with disabilities, such as Wynn Reader from Freedom Scientific. Using UDL, these technologies are made available for all students, thereby decreasing the stigma associated with using assistive technologies, making them “normal” and also increasing the availability by having multiple access points.

The following chart depicts some of the tools and assistive technologies that can be used with UDL:

AT:	Description:	Disability use:	UDL:
<b>Zoom Text</b> 	Enlarges text and graphics	Visually impaired	Minimizes eye strain when looking at internet or small items on screen
<b>Wynn Reader</b> 	Reads aloud, marks, highlights, defines scanned text, bi-modal access to text	Dyslexia, visually impaired	Gives alternative ways to read or hear text, helps with vocabulary, reading comprehension, ESL support
<b>Text Help -Read and Write</b> 	Word prediction, editing, reads text aloud; bi-modal access to text	Dyslexia, dysgraphia, language processing problems	Assistance with writing, literacy and language acquisition; auditory learning
<b>Homepage Reader</b> 	Reads internet sites aloud	Visual impairment, visual processing problems	Alternative access to internet; good for students with literacy or ESL issues or auditory learners
<b>Inspiration</b> 	Graphic display for writing, converts to Word for written text, brainstorming tool, diagramming tool, organizing templates	Organizing problems, language processing problems	Helps with writing projects, teaching organizing skills, creating graphics; visual learning
<b>Closed Captioned TV's, DVD's and VCR's; LCD projectors</b>	Shows text on TV screen; increases modalities by allowing for more visual and auditory presentations	Auditory processing; memory; ADHD, information processing	Bi modal access helpful to most learners, ESL and literacy support
<b>Dragon Naturally Speaking</b> 	Speech recognition application	Dysgraphia, ADHD, mobility impairment, language processing;	Allows alternative to writing or typing, helpful for literacy support, auditory learning
<b>Adjustable Work Stations</b>	Electronic work station allows for easy up and down movement	ADHD, mobility impairment, students with pain issues	Allows students to alter the height of the computer for comfort or accessibility

<b>Speaking/ Spelling Dictionaries</b>	Electronic dictionary/thesaurus which reads aloud	Dyslexia, visual processing, ADHD	Students can find words, get correct spelling, hear pronunciation
<b>Color Overlays</b> 	Colored overlays for reading	Dyslexia, visual processing, ADHD	Improves visual processing and minimizes eye strain and glare

## Assessment of Learning Styles and Multi-Modal Teaching

An important part of using UDL and teaching strategies effectively is understanding learning styles and using multi-modal teaching. We learn through our senses: sight, hearing, movement, smell and taste. Although we tend to use the first three in the classroom, the last two, smell and taste, are very powerful learning senses! A certain smell or taste can bring back very strong memories.

In teaching, we know that the more senses used, the more likely the material will be learned and retained. We also know that people tend to have a preferred learning sense or modality. Teachers tend to teach with their preferred modality. At RTC, instructors recognized the benefit of knowing their student's preferred learning styles or modalities so that they could make sure they were emphasizing strategies that used those modalities when teaching. For instance, if an instructor is mainly using lecture (auditory modality) but her students are mostly visual, that instructor would want to augment lecture with board notes, power points, hand outs, written material and other visual aids. There are many tools for finding out student's preferred learning styles online or at your local library.



## Assessment of Learning Barriers



Identifying students' learning barriers and helping with simple strategies or referrals for more intensive help is also important. While UDL strategies can open the doors of learning for many students, it is important to recognize that sometimes students need individualized help. Instructors should have a method of identifying potential problems and quickly making referrals to other resources.

## How do Instructors Choose UDL Strategies?

Instructors using UDL typically choose strategies based on their student learning styles or learning barriers. For example, as mentioned above in the Learning Styles section, instructors may find that their format is lacking in a balance of modalities and may decide to

implement strategies to increase visual, auditory or kinesthetic access to information or assessment.

Or, sometimes strategies are chosen to solve a particular problem that creates learning barriers for students. In a course with a great deal of need for memorization, for example, the instructor could choose to implement a menu of memorization strategies such as the use of mnemonics, chanting, rhythmic moving, air writing or visualization.

In June 2006, a survey of students in the UDL Project classrooms indicated that **over 90 percent felt that these strategies and UDL were positive and helpful.**

### **How UDL are you?**

Instructors at RTC created this checklist for the essential elements in a UDL classroom:

**UDL classrooms should use:**

- ★ White boards with different colored markers
- ★ Handouts on different colored paper
- ★ Flexible seating
- ★ Visual aids on the wall
- ★ Verbal and written information, supported by physical activities
- ★ Multiple points of access to learning (never just one!) i.e. internet & videos & lecture & activities
- ★ Overall framework for learning so students see the big picture and meaning

### **Return on Investment**

One of the things that makes UDL so popular, not only with instructors but also counselors and administrators, is the return on investment (ROI). Learning a few strategies and techniques to make the classroom more accessible makes sense to instructors. Students respond positively, and the outlay of effort is minimal for the most part. Strategies are often easily shared from classroom to classroom, instructor to instructor. Students can be empowered to use the strategies outside the classroom. All of these make for a high return on investment for the instructor's effort.

For counselors, UDL is helpful because it levels the playfield for many students without singling them out for accommodation. This works well for some students who are embarrassed or don't want to disclose a disability. It also helps "normalize" many assistive technologies and strategies which can make them more palatable for students and instructors. And finally, possibly the most important element for counselors is that UDL sets up an environment where it is recognized that students learn differently and have different abilities, but where all students can be successful.

For administrators, UDL offers an effective way to help with student retention and increase accessibility.

Performance measure analysis of the UDL Project has revealed that student completion rates across all of RTC has improved since the beginning of the project in 2002. ***The greatest gains have been made by students with disabilities in the UDL Pilot classrooms.***

More students are coming forth to disclose disabilities or be helped with diagnosis. Student reporting disabilities has gone from 1 % in 2001, prior to the project, to 6 % in 2005/06. We don't believe this is due to an influx of new student with disabilities; we think these are students who were already here who are feeling more accepted in their classrooms and comfortable about telling us!



## **Some Examples of UDL in RTC Classrooms**

Over half of the full time instructors at RTC were involved in the UDL Pilot by 2006 following is a list of some of the strategies being used by instructors at RTC in various programs.

### **LOW TECH**

#### **The "Instructor Toolkit"**

This simple but effective and popular strategy was the brainchild of Judy Campbell from the Institute of Extended Learning in Spokane. A kit of low tech tools for reading, organizing, note taking and learning are made available for students to use. Our kits include the items below which we also make sure are available for purchase in the campus bookstore:

- Magnifying bars and sheets
- Kinesthetic manipulative (squishy balls, gel bags)
- Organizers (highlighters, colored pens & pencils, different sizes of post-it notes)
- Colored overlays to minimize glare and help with eye strain
- Masking tools for reading (cardboard strips, rulers)
- Large button calculators
- Index and flash cards



## **Expanded Syllabus**

Offer a visual “road map” for the course on the course syllabus by using enlarged print, highlighting & bolding to accent important dates, assignments, and tests, including important dates, weights of assignments, links and resources for supplemental reading, videos and more. Students benefit by always understanding what is in store for them and how everything fits into the big picture.



## **Organizational Skills**

The number one strategy for helping for students with LD and ADHD --helps all students!

- Put assignments and due dates on board each day
- Giving handouts with holes punched and show them how to put them in binders
- Show guidelines for filing
- Create activities to help students with organizational skills including note-taking, goal setting, time management and planning

## **Use variety of techniques for memorizing**

- Mnemonics, [http://www.web-1/memory/mnemonic\\_techniques.htm](http://www.web-1/memory/mnemonic_techniques.htm)
- Research on the internet
- Drawing or creating pictures
- Chanting
- Flashcards



## **Team based, peer teaching approach to reinforce learning**



Students are assigned to teams and given areas of expertise: organization, content and computer skills. Each student is responsible for learning his/her expert area and quality controlling his/her team’s work in that area. After a set amount of time, new roles are assigned so that eventually every student has to be an expert in each area. This combines team work and peer teaching, two very powerful teaching strategies.

## **Standing–sitting adjustable workstations**

These tables, accessible for wheelchair users, also let students stand or sit when working which helps to minimize pain and allows movement for students with ADHD. But they also help students who just get sleepy in the afternoon or early morning!

## **Create a lending bank of CDs and DVDs**

Creating opportunities for students to have assignments and supplemental readings and link at their fingertips is getting simpler all the time. Some instructors create a folder where all materials are stored and let students burn CDs or DVDs so that they can

always get access to the information. Video tape a demonstration and put it there for students to take home to review on their own!

### **Teach students to read and study using highlighters**

<http://www.thecorporateeducator.com/uploads/2006.01.archive.htm>



### **Personality inventory to help with team building**

*True Colors*, assists students in developing intrapersonal skills as well as being aware of their own learning and teamwork strengths and weaknesses.

[http://www.truecolors.org/color\\_meanings.html](http://www.truecolors.org/color_meanings.html)



### **Make lecture notes or guided notes available in hardcopy**

A visual resource to accompany lectures, this helps students understand important concepts and organizational skills.

<http://telr.osu.edu/dpg/fastfact/fastfactcolor/GuidedNotes.pdf>

### **Create meaning for students by showing how classes and subjects interrelate**

Increases the ability to see larger systems, recognize patterns, and think critically.

### **Safe Spelling**

This strategy helps students learn to spell by allowing them a “safety zone” where they can misspell words without penalty if they circle the words they believe to be misspelled. This helps students take more risks with writing and scaffolds the process of identifying misspelled words, a critical step in learning to spell!

## **HIGH TECH**

### **Use email**

- To send and receive writing assignments
- To give feedback to students
- To make handouts and other materials available so text readers and translators can be used to readily access the information.



### **Shared Network Space, Blog or Website**

Make classroom materials available for downloading in the computer lab, assistive technology computer workstation, or student’s home computer to increase accessibility of information for students who have difficulty with auditory processing or English skills.

## Mp3 players



Digitally tape key lecture points and pronunciation guides for students to download.

## Record computer screen demonstrations

There are easy to use and inexpensive tools for capturing and playing back computer screens with voice overlays.

Examples:

- Screencorder

<http://www.matchware.net/en/products/screencorder/default.htm>

- Camtasia <http://www.techsmith.com/camtasia.asp?CMP=KmsnCStm>

## Tablet PC

Use an interactive computer screen projected on whiteboard for displaying information and annotating. Notes including annotations can be downloaded onto a computer for students to see later. [http://en.wikipedia.org/wiki/Tablet\\_PC](http://en.wikipedia.org/wiki/Tablet_PC)



## Wynn Reader assistive technology to improve reading and writing skills

This AT was created for students with learning disabilities but helps students with ESL problems too! Word prediction, text-to-speech program, colorizes, changes size and font [http://www.freedomscientific.com/LSG/tipsheets/tip\\_wn\\_ez\\_toolbars.asp](http://www.freedomscientific.com/LSG/tipsheets/tip_wn_ez_toolbars.asp)

## Use a multi-modal learning styles inventory (audio and visual) computer program

To teach students their learning styles and gives them methods to improve their learning abilities. Instructor works with students to apply the methods. There are many online or for purchase.

[http://en.wikipedia.org/wiki/Learning\\_styles](http://en.wikipedia.org/wiki/Learning_styles)

## **Contact Information**

For more information, contact:

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**UDL Project Webpage:** <http://www.rtc.edu/AboutUs/DSDPGrant>

**UDL Project Faculty Webpage:** <http://webs.rtc.edu/ii/dsdp.html>

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