

# Next Steps for Students with Learning Disabilities at the University of Florida



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Disability Resource Center  
University of Florida

# Learning Disabilities & Attention Disorder

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- **Most prevalent disorder on college campuses**
  - ~60 % of students reporting a disability<sup>1</sup>
- **Life long disorder; Invisible disability**
  - A neurological disorder that affects the brain's ability to receive, process, store, and respond to information<sup>2</sup>
- **Learning Disabilities = “umbrella” term**
  - Specific LD diagnosis can vary from person to person
- **~ 31-45% of individuals with LD or AD have both<sup>3</sup>**

1. U.S. Department of Education, National Center for Education Statistics. (2015). Digest of Education Statistics, 2013 (2015-011), Chapter 3.
2. Cortiella, Candace and Horowitz, Sheldon H. The State of Learning Disabilities: Facts, Trends and Emerging Issues. New York: National Center for Learning Disabilities, 2014.
3. DuPaul, et al., 2013. DOI: 10.1177/0022219412464351

# Learning Disabilities at UF

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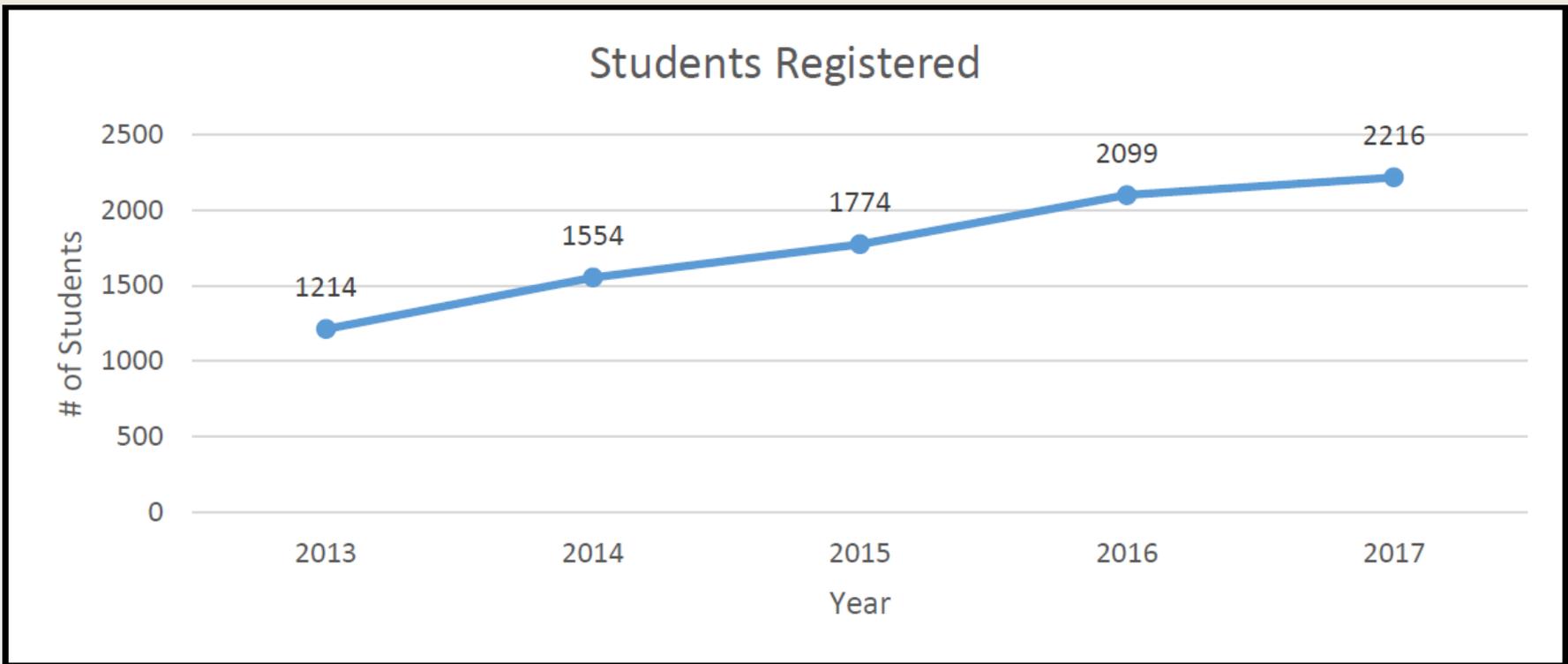
- Average of 1,325 students with disabilities registered with the DRC during 5-year period of 2009-2014 ( 2.6% of total UF student population)
- DRC Student Population July 2016
  - 26% Attention Disorders
  - 19% Learning Disorders
- Students with LD
  - 1/2 rate (21%) attendance at 4 year college versus general population (40%); 2x rate attendance at 2-year college<sup>2</sup>
  - College completion rates: 41% (LD) versus 52% in general population<sup>1</sup>
  - 11% of Students with LD report disability to college/university<sup>2</sup>

1. Cortiella, Candace and Horowitz, Sheldon H. The State of Learning Disabilities: Facts, Trends and Emerging Issues. New York: National Center for Learning Disabilities, 2014.

2. NLTS-2, 2011 : [http://www.nlts2.org/data\\_tables/tables/14/np5S5i\\_K8g\\_YNfrm.html](http://www.nlts2.org/data_tables/tables/14/np5S5i_K8g_YNfrm.html) retrieved August 11, 2016

# UF DRC Student Population

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# Challenges for Students with LD/AD

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- Often unaware of how their LD symptoms impact their academic and essential life skills<sup>1</sup> – more difficulty with:
  - Time management; maintaining effective daily routines
  - Coping with stress; communicating needs
  - Organizational skills
  - Problem solving skills
- Need strong supports; lower self-esteem<sup>1</sup>
  - Often unaware of / under-utilize resources and support services
  - ↑ Self-efficacy, ↑ academic persistence, ↑ effectiveness of strategy use<sup>2</sup>

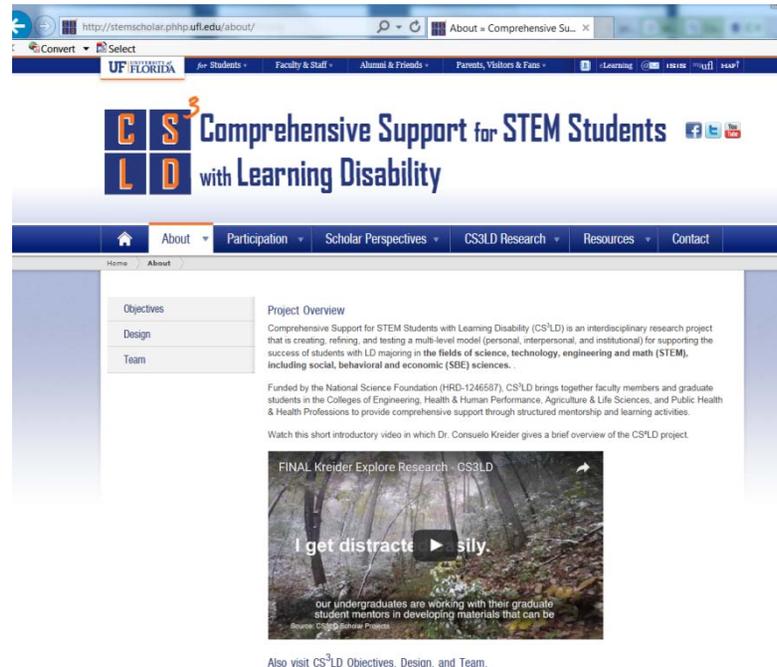
1. Reiff, H., Hatzes, N., Bramel, M., & Gibbon, T. (2001). The Relation of LD and Gender with Emotional Intelligence in College Students. *Journal of Learning Disabilities*, 34(1), 66-78.

2. Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of educational research*, 66(4), 543-578.

# Comprehensive Support for STEM Students with Learning Disabilities (CS<sup>3</sup>LD)

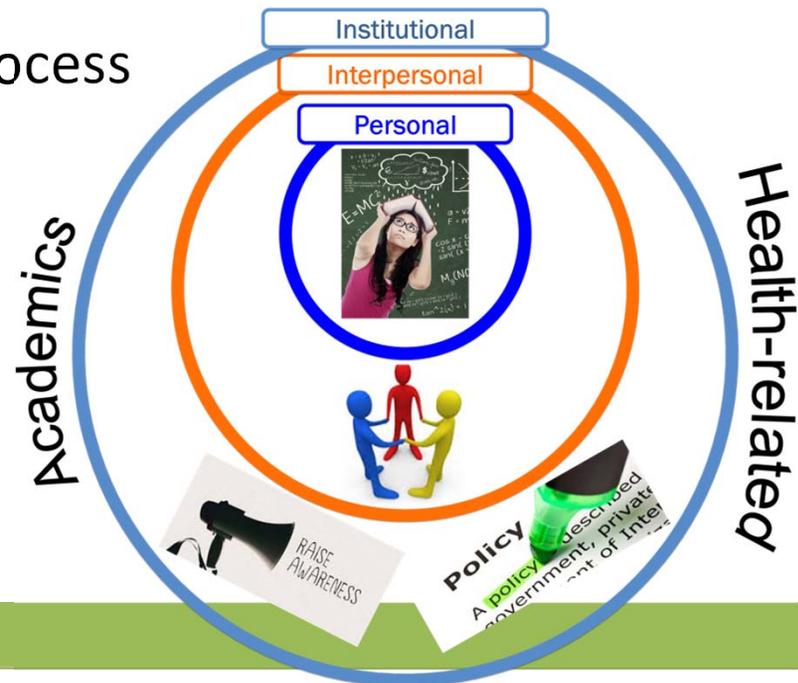


[HTTP://STEMSCHOLAR.PHP.UFL.EDU/](http://STEMSCHOLAR.PHP.UFL.EDU/)

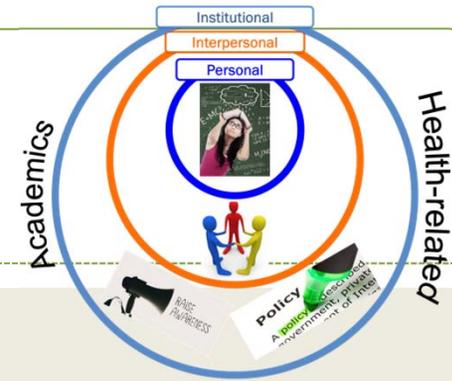
A screenshot of the CS<sup>3</sup>LD website. The browser address bar shows 'http://STEMSCHOLAR.PHP.UFL.EDU/about/'. The website header includes the University of Florida logo and navigation links for 'Students', 'Faculty & Staff', 'Alumni & Friends', 'Parents, Visitors & Fans', 'Learning', and 'Help'. The main heading reads 'Comprehensive Support for STEM Students with Learning Disability'. A navigation menu includes 'Home', 'About', 'Participation', 'Scholar Perspectives', 'CS3LD Research', 'Resources', and 'Contact'. The 'About' page content includes a 'Project Overview' section with text about the interdisciplinary research project, a video player titled 'FINAL Kreider Explore Research - CS3LD' with a play button and the text 'I get distracted easily.', and a caption: 'our undergraduates are working with their graduate student mentors in developing materials that can be...'. At the bottom, it says 'Also visit CS<sup>3</sup>LD Objectives, Design, and Team.'

# Design

- Comprehensive Support for STEM Students with Learning Disabilities (CS<sup>3</sup>LD)
  - Design: One-group multi-method
  - Theoretically informed *conceptual model* → Participant informed *implementation model*
- Continuous improvement process
  - ✓ Outcome surveys
  - ✓ Feedback surveys
  - ✓ Focus groups
  - ✓ Interviews
  - ✓ Case reports
  - ✓ Implementation data

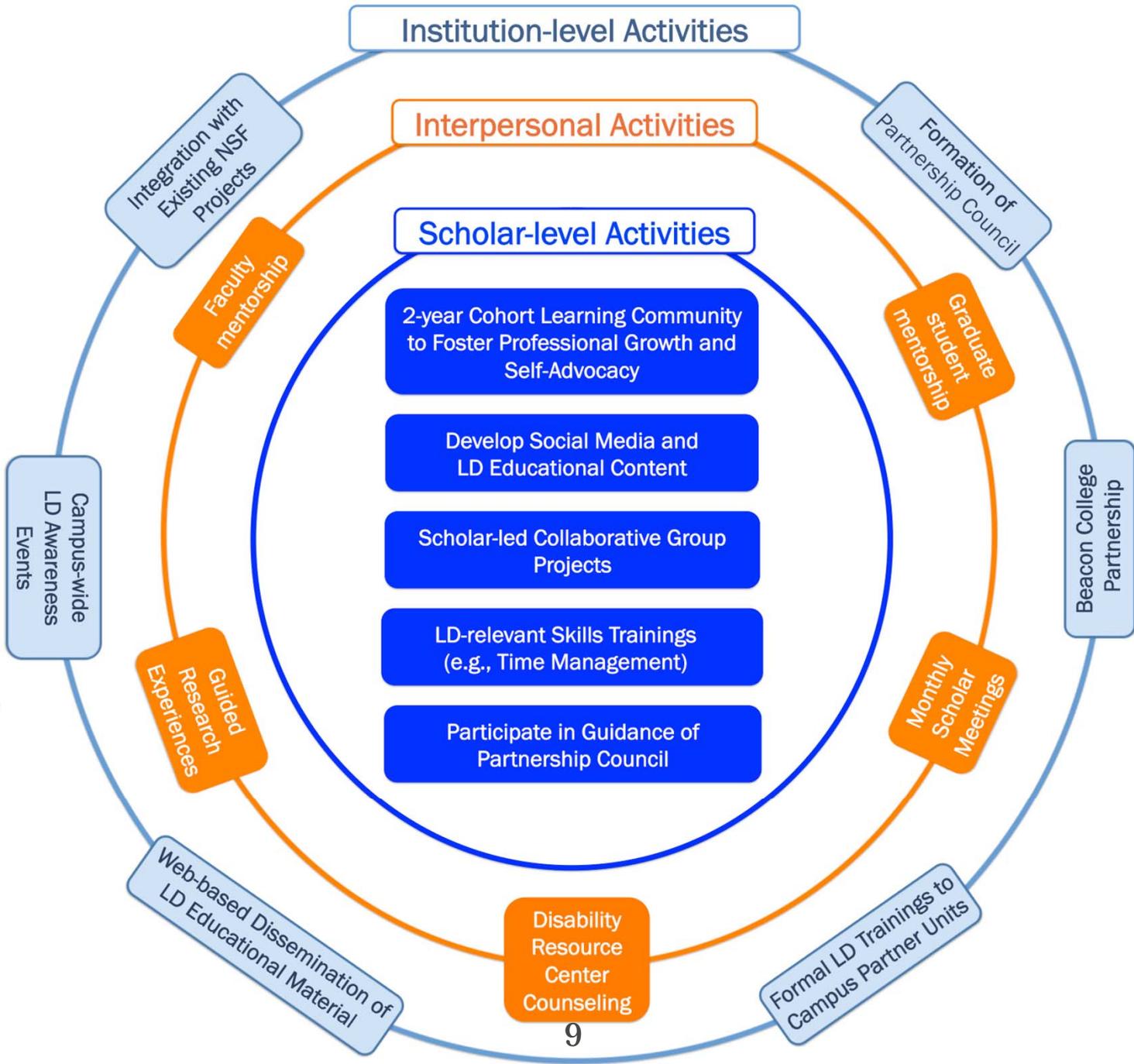


# CS3LD Goals



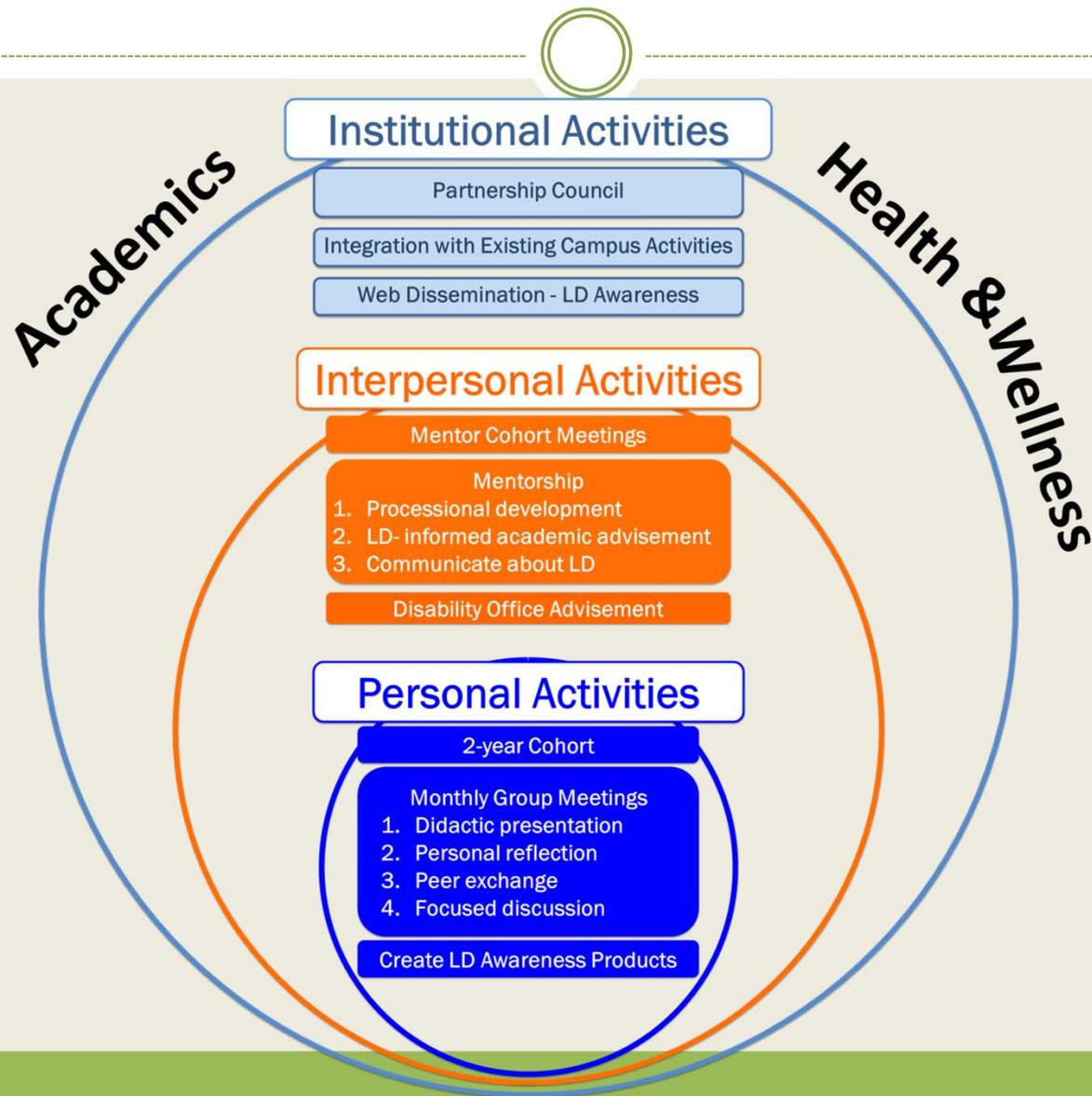
- **Personal**
  - Create mechanisms for CS<sup>3</sup>LD undergraduate engagement designed to foster **self-advocacy**, **self-efficacy**, and increased **campus connection**.
- **Interpersonal**
  - Create multi-disciplinary mentorship teams for each CS<sup>3</sup>LD scholar that will improve mentoring and **professional enculturation** to STEM disciplines.
- **Institutional**
  - Create a campus-wide **network of health and STEM faculty**, staff, graduate students, and academic units **knowledgeable** and coordinated in facilitating success of students with LD.

# Academics



# Health

# Implementation Model



# CS<sup>3</sup>LD Activities

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- **Personal**: Undergraduate Group Trainings: self-advocacy; understanding symptoms & capacities; time & stress management
- **Interpersonal**: Mentors →
  - professional enculturation: helping understand the reality of their field – guided discovery
  - social support: acknowledging their hard work
  - empowerment mentor: instilling confidence to make decisions
- **Institutional**: Faculty & Administrators → Institutionalization of awareness & UDL training

# CS3LD Engagement

<b>Participants (<i>n</i>)</b>	<b>Undergraduate Completion (%)</b>	<b>Graduate Student Engagement (<i>n</i>)</b>
Undergraduates with LD (52)	Completed all available semesters (75)	Withdrew (9)
Graduate student mentors (52)	Withdrew in Year 1 (15)	Mentored more than 1 (4)
Faculty mentors (36)	Withdrew in Year 2 (10)	Volunteered (8)
Partnership Council (32)		Volunteered but eventually withdrew (4)

- **Partnership Council:** 11 academic and 9 student service units participated in the faculty committee; 30 (94%) actively engaged in committee activities.
- Graduate students with teaching assistantships reported greater understanding of students learning differences within their classrooms.
- For undergraduates who developed more than one LD awareness product (30/52), shifts toward more positive messages were observed in 76%.
- Collaborations among faculty committee participants have resulted in two training grant proposal incorporating supports for diverse learners.

# Undergraduate Sample ( $n = 52$ )



<b>Sex (%)</b>	<b>Race (%)</b>	<b>Field of Study (%)</b>	<b>Age (years)</b>	<b>Age Diagnosed (years)</b>	<b>Other College Prior (%)</b>
Male (50)	White (71)	Science (32)	median (20)	median (18)	Yes (29)
Female (46)	Black (15)	Technology (6)	min (18)	min (4)	No (69)
No report (4)	Asian (2)	Engineering (23)	max (33)	max (29)	No report (2)
	Other (8)	Mathematics (6)			
	No report (4)	Social/Behav. (33)			

## Undergraduates' symptoms

- Digital visual analogue scale
- 0=no difficulty, 100=extreme/constant difficulty

Difficulty with...	Median (Inner Quartile Range)
Staying focused	75 (62, 94)
Managing time	65 (50, 81)
Extensive writing assignments	65 (31, 85)
Reading comp. - textbooks/academic publications	64 (50, 81)
Organization	62 (47, 79)
Memorizing and retrieving information from memory	57 (23, 85)
Following multi-step directions	56 (34, 70)
Expressing thoughts or opinions clearly	53 (22, 71)
Following others when they speak in conversation	50 (21, 73)
Applying different approaches to one problem	38 (18, 56)
Initiating activities, tasks, or independent ideas	34 (18, 63)

# Meaningful Discussion Topics to our Scholars

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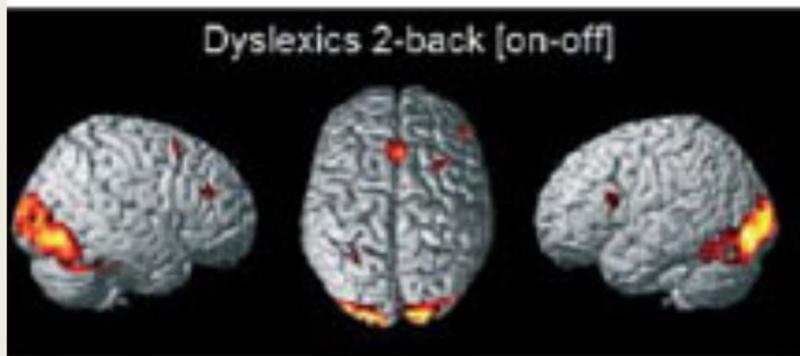
1. **Neurology of LD/AD (As a strengths-based approach)**
  - **Cognitive Styles Common To LD/AD<sup>1,2</sup>**
    - **Big Picture Thinking (Interconnected Reasoning)**
    - **Dynamic Reasoning**
    - **Narrative Reasoning**
    - **3-Dimensional Spatial Reasoning**

1. Eide, B. L., Eide, F. F. (2011) *The Dyslexic Advantage Unlocking the Hidden Potential of the Dyslexic Brain*. Plume: New York.
2. <http://www.dyslexicadvantage.org/mind-strengths-in-dyslexia-what-are-they/>

# Neural Differences

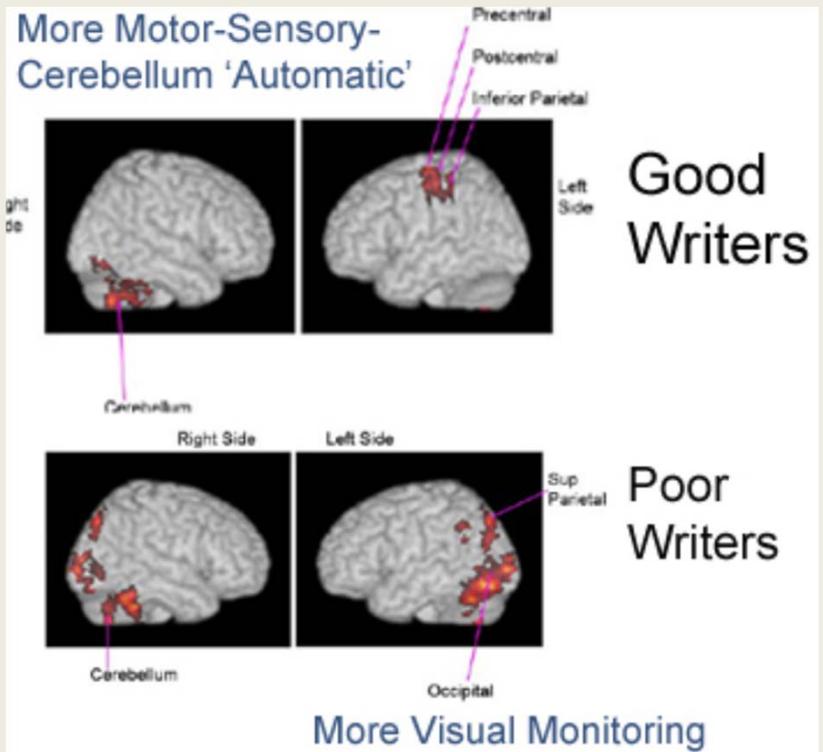
16

**Dyslexia: ↓ Language Center activation**



Beneventi et al., Int J Neurisci, 2010

**Dysgraphia (writing)**



Richards et al., 2011

# Big Picture Thinking (Interconnected Reasoning)

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- Ability to spot relationships between different concepts & points of view
  - multiple points of view
  - borrows approaches from other disciplines
- Easily sees relationships of similarities or association/causation
- Strong conceptual ability in uniting disparate information into a single global view (i.e., gist)



# Dynamic Reasoning

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- Intuits solutions, then works backwards to check potential path(s) to solution
  - Slower, more difficult discernment of path(s)
- Uses the “best fit” cognitive processes rather than rule-based/deductive/formulaic thinking
- Career implications: cutting edge fields , inventors & researchers
  - Good reasoning for highly changeable or ambiguous situations where knowledge is incomplete

# Narrative Reasoning

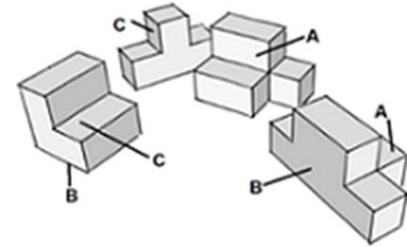
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- Tendency to use stories to recall the past, understand the present and imagine the future
- Career implications: Great for communicating a vision as a business leader, in the courtroom
- Students: can use stories to boost memory



# 3-D Spatial Reasoning

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- Non-verbal reasoning
- Enables reasoning about:
  - The shape, size, motion, position of objects in the physical world
  - Orientation in space
  - The way objects in physical world interact
- Spatially gifted → verbally challenged
  - Arduous process of putting thoughts into words

# Meaningful Discussion Topics to our Scholars (cont.)

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- 2. Time management; understanding temporal organization (e.g., class selection, professional goal setting, extracurricular activity prioritization)**
- 3. Communication as part of self-advocacy & framing symptoms/needs/strengths**
- 4. Symptom awareness in range of current & anticipated everyday contexts (intrapersonal symptom awareness)**
- 5. Matching symptoms, needs & resources [but our Scholar's didn't really love this, because we were in group format?]**

# Gold Standard Accessibility: What is UDL?

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## UDL Principles → Multiple Means of...

### Representation

Various ways of  
**learning the  
information**  
(e.g., hear & see)

The “**what**” of  
learning

### Expression/ Action

Alternative or various  
ways of demonstrating  
they **know the  
content**

The “**how**” of  
learning

### Engagement

Tapping into student’s  
**interests &  
challenging** them in  
**motivating** ways

The “**why**” of  
learning

# Multiple means of representation: The “what” of learning

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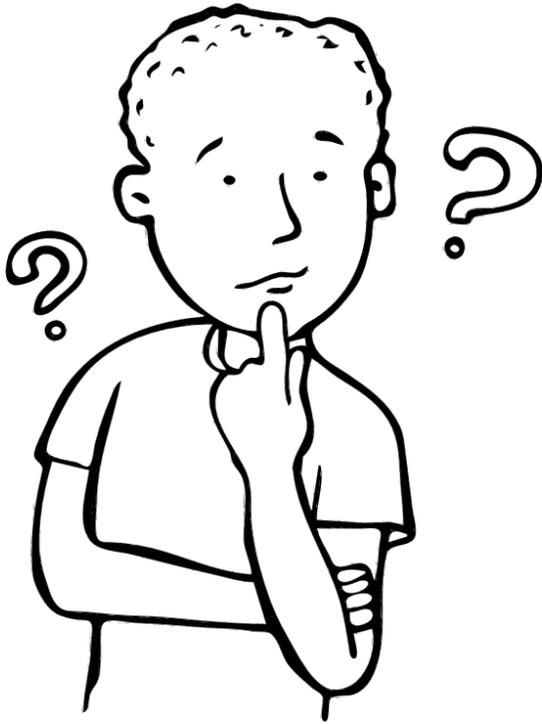
- “can you explain this in a different way?”
- “Recapping at the end of class...”
  - “...just a real quick recap”
- “..he just talks, I draw what he says.”
- “leave it on the board just a little bit longer”



# Multiple means of expression:

## The “how” of learning

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- “Please bear with me...It takes me longer to understand”
  - “Studying takes longer, taking my exams takes longer...”
- “Clear directions, in the right order...and all parts of the instructions in one place”
- “...looking around when I took my tests and getting accused of cheating when I wasn't. I need a small testing environment...”

# Multiple means of engagement: The “why” of learning

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- “...not a copout or an excuse”
- “I thought I wasn’t good enough for UF”
- “I tended to just blame it on myself for being stupid”
- “I never procrastinate. I don't trust myself. I do it early.”
  - Course calendar very important



# In a nutshell: Concerns

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- **Academic Misunderstanding**

- “...you’re just playing the disability card... oh you’re just not trying hard enough and I’m trying, like a lot”



- **Different Learning Styles**

- “...no one knows how hard it is to accommodate me having a learning disability because we all learn in different ways”

- **Health/Wellness**

- “ADHD can contribute... and that of course affects my overall health...without consistent medication and then when I’m down I don’t want to exercise.”

## In a nutshell: Concerns

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# In a nutshell: Motivators

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- **External Support**

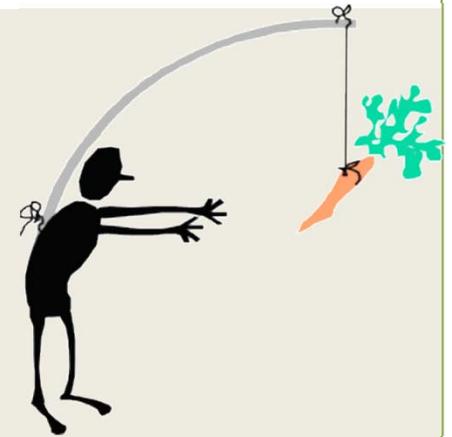
- “Positive support is a major motivation and will be that extra support we need to succeed.”

- **Believing in Self**

- “...a lot of my motivation comes from my own feelings of self worth, and how well I feel like I get along with society...”

- **Stress/Competition**

- I need to do more to prove myself than others and/or to compensate for the history of medical withdrawals and time out of college.”



# Potential Advising Practices Related to LD

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- Temporal Sequencing
- Poor time management
  - Strategic class picking
- Visual learning
  - Visual Rubric
  - Course mapped out visually instead of with language



“...a nice table of the course number, what semester it was offered... so that way you knew when it was...the name of the course, the prerequisites and co-requisites ... all on one sheet “

**Aerospace Engineering - Bachelor of Science Curriculum ~ (Catalog Year: 2015-2016)**  
*Although this is a suggested outline - All courses listed below are REQUIRED for this degree. Refer to the Undergraduate Catalog for verification*

Student's Name: \_\_\_\_\_ UFID: \_\_\_\_\_ Today's Date: \_\_\_\_\_

ⓈThe tracking courses for MAE are: MAC2311, MAC2312, MAC2313, MAP2302, PHY2048, PHY2049, CHM2045 & Sci Elec: (CHM2046, BSC2010, PHY3101 or AST3018/3019) \*asterisk means that they require a Grade of "C" or better. ⓉAll undergraduate students (except those transferring to UF with an A.A. degree from a Florida State/Community College or University) are required to satisfy: 15cr-Humanities/Social Science(H/SS); 3cr-Diversity(D); 3cr-International(I). (Some (D/N) courses will double count with H/SS courses, check the undergraduate catalog for further explanation, under "General Education Requirement"). ⓊWriting Requirement-24,000 words(WR). ⓋSummer Requirement-9cr (Must be taken at any State of Florida University not State/Community Colleges).

Upper Division Courses that have an "#" next to them - requires a grade of "C" or better.

✓	Course Prefix and Number	Cr	Course Title	Projected Offer	Pre-Requisites
<b>Semester 1 (15cr)</b>					
	*CHM 2045 or 2095	3	General Chemistry 1 / Chemistry for Engineers 1	F S Su	Chemistry Readiness Assessment
	CHM 2045L	1	General Chemistry Lab 1	F S Su	
	*MAC 2311	4	Analytical Geometry & Calculus 1	F S Su	Mathematics Placement Exam (ALEKS)
	GE - C	3	Composition-[WR] (Ex: ENC1101 or any composition course)	F S Su	ACT/SAT scores do not exempt this requirement
	IUF 1000 (GE-H)	3	What Is The Good Life (Required)	F S Su	All incoming freshmen w/out an AA degree
	EML 2920	1	Departmental & Professional Orientation	F S	
<b>Semester 2 (14cr)</b>					
	*MAC 2312	4	Analytical Geometry & Calculus 2	F S Su	MAC2311
	*PHY 2048	3	Physics with Calculus 1	F S Su	MAC2311
	PHY 2048L or 2053L	1	Physics Lab 1	F S Su	
	EML 2023	3	Computer Aided Graphics & Design (Laptop Req'd)	F S Su	
	ENC 3246 [offered by the Writing Program]	3	Professional Communication for Engineers	F S Su	ENC1101 or test score equivalency
<b>Semester 3(Summer) (9cr)</b>					
	GE - SS	3	Social & Behavioral Sciences (State Core)	F S Su	
	EMA 3010	3	Materials	F S Su	CHM2045
	*Science Elective (Pick 1)	3	<input type="checkbox"/> CHM2046/2096 <input type="checkbox"/> BSC2010 <input type="checkbox"/> PHY3101 <input type="checkbox"/> AST3018/3019	F S Su	Check catalog for Pre-requisites
<b>Semester 4 (15cr)</b>					
	*MAC 2313	4	Analytical Geometry & Calculus 3	F S Su	MAC2312
	*PHY 2049	3	Physics with Calculus 2	F S Su	MAC2312 & PHY2048
	PHY 2049L or 2054L	1	Physics Lab 2	F S Su	
	COP 2271 (Lab is optional) [offered by ISE Dept]	2	Computer Programming for Engineers Matlab <i>No Substitutions-Degree Audits will be updated to reflect this change</i>	F S Su	MAC2312
	EAS 3020C	3	Introduction to Flight	F S	PHY2048 & MAC2311
	#EGM 2511	3	Engineering Mechanics - Statics	F S Su	PHY2048

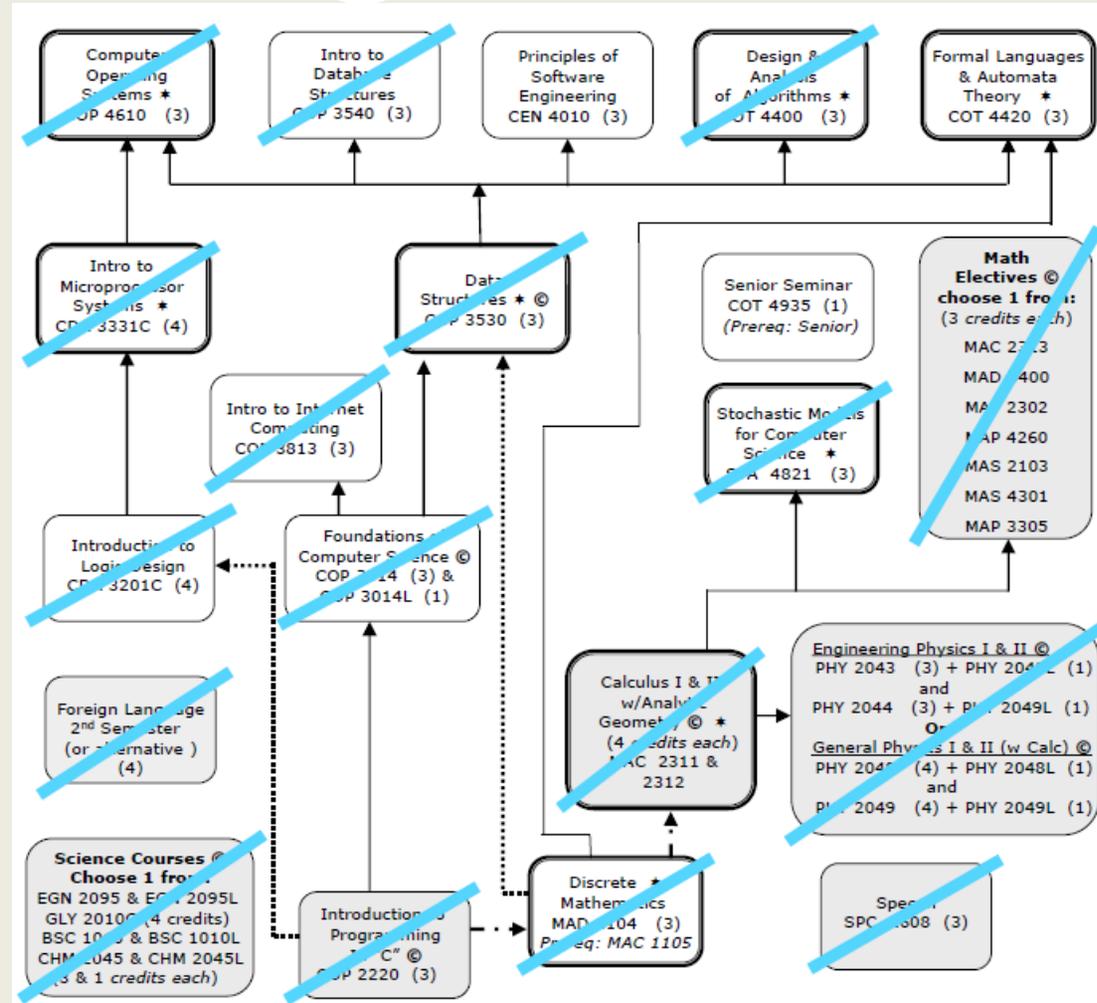
**Lets look at the handout –  
 What are your thoughts?**



# Contrast this with an advising *flowchart*

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FAU  
Computer  
Science advising  
flowchart and  
table



# Personal Level Measures



Shapiro-Wilk & Wilcoxon Signed Ranks test

- Baseline and after two semesters
- Online survey administration

Medians and Ranks

<b>Instrument (<i>n</i> Available for Analysis)</b>	<b>Score Difference (test statistic, <i>probability</i>)</b>	<b>Baseline Total Score</b>	<b>2nd Semester Total Score</b>	<b><i>n</i> Positive Difference</b>	<b><i>n</i> Negative Difference</b>
ABCS* (39)	6 ( $z = -.170, p = .03$ )	<b>87</b>	<b>95</b>	24	15
IIS† (38)	8 ( $z = -3.677, p < .001$ )	<b>101</b>	<b>116</b>	29	9

*Note: higher scores desirable*

\*ABCS = Academic Behavioral Confidence Scale

†IIS = Institutional Integration Scale

# Moving Forward

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## 1. MANUSCRIPTS & CONFERENCES

1. Time >> Temporal experiences related to L/AD
2. Scholar Projects >> shifts in Disability Identity (Gibsons 2006):  
Passive Awareness > Realization > Acceptance

## 2. INSTITUTIONALIZATION

1. Blending with DRC groups
2. Partnership Council
3. Toolkits

# Manuscripts...

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- The model – where we started & what we ended up with
- Stressors of LD/ADHD & sources of coping/resilience
- Developing an intervention – Scholar level activities
- CS3LD Mentorship
  - Experiences & meaning of non-LD/ADHD mentors
  - Supports needed by grand-student mentors in mentoring students with LD/ADHD
- LD/ADHD difficulties, strengths, strategies & supports for occupational performance across the range of their contexts
- ASD case study – comparing his responses (needs & experiences) to responses of other scholars

# Institutionalization

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1. Cohort 4 Scholars to join DRC meetings
  1. Logistics of it...
2. Partnership Council
3. University Resources
  1. CS3LD Website
  2. Videos for faculty: <http://teach.ufl.edu/library/>
4. Toolkits
  1. Please invite me back...

# CS3LD team – it takes a village...

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## Our CS3LD team:



- Sue Percival, PhD, Food Science & Human Nutrition
- CY Wu, PhD, Environmental Engineering Sciences
- Charles Byrd, PhD, Center for Assessment, Strategic Planning, Evaluation and Research



- Anthony DeSantis, PhD, Associate Dean of Students, Disability Resource Center
- William Mann, PhD; Anthony Delisle, PhD; Jim Gorske, M.Ed.



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