



Universal Design Solutions in Instruction and Assessment: Explore the Opportunity of Accessible Technology-based Assessment

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IDEA and Universal Design

- “the state educational agency shall, to the extent feasible, use *universal design principles* in developing and administering any assessments under this paragraph” (IDEA- PL 108-446, Section 612,16E, 2004)



USDOE Peer Review Guidance, April 28, 2004

- “the use of *universal design principles* holds great promise for designing and aligning standards, curriculum, instructional materials and strategies. Assessments that are designed to be valid and accessible for the *widest range of students* may help all students struggling to achieve, particularly students with cognitive disabilities...

Universal Design for Learning (UDL) www.cast.org

Universal Design for Learning provides a blueprint for creating flexible goals, methods, materials, and assessments that accommodate learner differences





A universally-designed curriculum or assessment offers the following:

- Multiple means of representation to give learners various ways of acquiring information and knowledge
- Multiple means of expression to provide learners alternatives for demonstrating what they know, and
- Multiple means of engagement to tap into learners' interests, challenge them appropriately, and motivate them to learn



Students in Need of Alternate Assessment

- Truly represent the “widest range”
- Tend to have “print disabilities” and are in need of presentation and expression in alternate formats
- Benefit from and require universal design for learning (UDL) to access the general curriculum and assessment

UDL Initiative in Kentucky: 2001 to Present



- Computerized literacy supports (text readers) in every school
- Availability of accessible digital curriculum
- Accessible electronic state assessment

Computerized Literacy Supports: Building the Technology Infrastructure for Use of Digital Text

- Since 2001 over 1300 KY schools (95%) have acquired a Texthelp Site license (i.e., Read & Write Gold) @ 50% discount
- Software includes text to speech, speaking spell check, dictionary, word prediction, etc.
- Inclusive reader (reads in window)



Districts with textreader site license





Accessible Digital Curriculum

- Increasing number of states requiring publishers to provide accessible digital copies of textbooks
- Federal law (IDEA) requires all publishers provide accessible digital textbooks by December, 2006 (NIMAS)

*Increasing Numbers of States Requiring
Publishers to Provide Textbooks in
Accessible Digital Format*

Kentucky 

Arizona 

Texas 

New York 

Florida 

Georgia 

California 



Accessible Digital Textbooks in KY

- SB 243- KY Digital Textbook Law (2002)
 - Set state standard for digital textbooks
- KY Accessible Materials Consortium (KAMC)
 - Digital text repository and distribution center
- KY Accessible Materials Database (KAMD)
 - Schools can view & request digital textbooks online
- Kentucka-Tools for Low Incidence Students



National Instructional Materials Accessibility Standard (NIMAS)

- Development supported by Office of Special Education Programs (OSEP), USDOE
- Included in Part D & B of Individuals with Disabilities Education Improvement Act (IDEA-2004)
- NIMAS TA Center at CAST
 - <http://nimas.cast.org/>



National Instructional Materials Accessibility Standard (NIMAS)

- NIMAS establishes a standard file format for digital textbooks
- Required that all publishers comply by December, 2006
- Publishers to provide digital copies to NIMAC for distribution to states
 - *National Instructional Materials Access Center @ American Printing House for the Blind*
 - <http://www.nimac.us/>

Accessible Assessment

Commonwealth Accountability Testing System (CATS)

An accommodation for Ky. Core Content Test
(grades 4,5,7,8,10,11,12)

CATS Online





Use of “Reader” as an Assessment Accommodation

- Annually approximately 15,000 (40% of those tested) KY students with disabilities require a “reader” as a state assessment accommodation
- Significant number of KY students moving from dependency on “human” reader supports to independence using computer reading supports (i.e., textreader)



Which Students are Eligible for CATS Online?

- Students with an IEP, PSP (LEP), or 504 Plan which includes the need for a “reader” or assistive technology as an instructional and assessment accommodation
- Students who routinely use textreader or screenreader technology to access printed material in classroom instruction and assessment
- Students who have accessed and used the CATS Online Practice Area



KY Experience to Date with Online Accessible Assessment

- Two online pilots tests in 2002
- Spring 2003 — first full online assessment
 - 16 districts—29 schools—204 students
- Spring 2004 — second full assessment
 - 36 districts—74 schools—510 students
- Spring 2005 — third full assessment
 - 54 districts – 147 schools – 1235 students (35 LEP)

Online Accessible Assessment for 2006



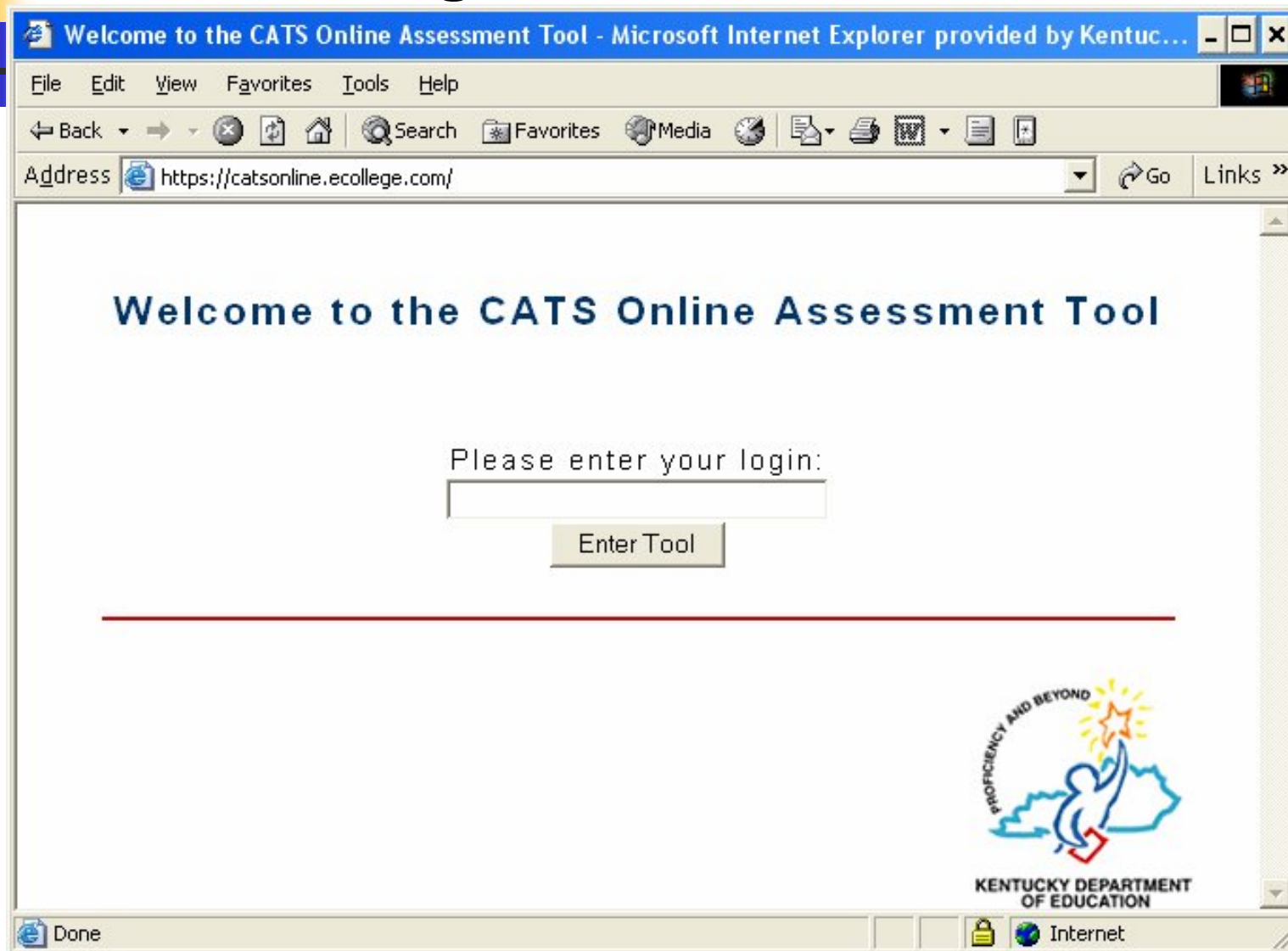
- District pre-count projected numbers:
 - 69 districts – 220 schools – 3800 students
- Changes for 2006
 - Addition of NRT grades/NCLB requirement
 - Two online assessment systems:
 - Continuation of Kentucky Core Content Test delivered by eCollege
 - Norm-referenced tests delivered by CTB/McGraw-Hill

CATS Online

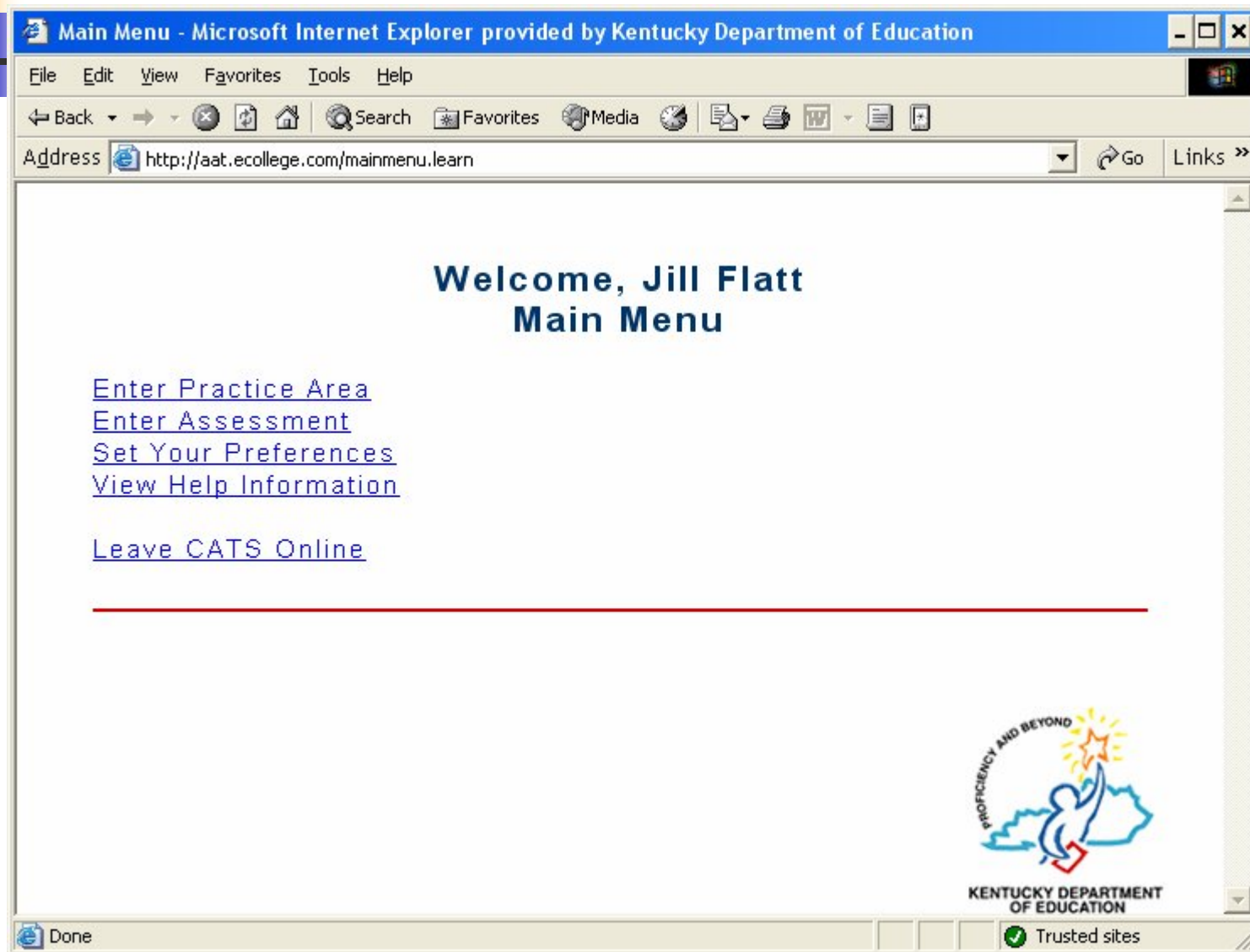
Basic Design/Accessibility Issues

- Digital text readable with textreader or screenreader
- Choice/variety of screen presentation modes
- Setup for blind, low vision, or sighted user
- One question/answer per screen
- Reading passages presented in choice of formats
- Optional alternative text for graphics
- Headphones for privacy and engagement

Student View: Log in with user ID



Student View: Welcome screen




The screenshot shows a Microsoft Internet Explorer browser window. The title bar reads "Main Menu - Microsoft Internet Explorer provided by Kentucky Department of Education". The address bar contains the URL "http://aat.ecollege.com/mainmenu.learn". The main content area displays a welcome message and several links.

**Welcome, Jill Flatt
Main Menu**

[Enter Practice Area](#)
[Enter Assessment](#)
[Set Your Preferences](#)
[View Help Information](#)

[Leave CATS Online](#)


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Done Trusted sites



CATS Online & Universal Design: Multiple Means of Representation

- Student chooses font, color preferences
- Student choices of screen presentation (e.g., full screen, dual frame)
- Student control of voice type, speed, pitch and volume

Student View: Set Preferences

Set Your Preferences - Microsoft Internet Explorer provided by Kentucky Department of Education

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print Mail News RSS Feeds

Address <http://aat.ecollege.com/help/preferences.learn?StudentPK=68&OrgPK=83> Go Links >>

Set Your Preferences

Question Font Size

Question Font Type

Question Font Color

Question Background Color

Answer Font Size


Answer Font Type

Answer Font Color

Answer Background Color

[Go to Practice Area](#)

[Return to Main Menu](#)

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Student View: New Preferences

Set Your Preferences - Microsoft Internet Explorer provided by Kentucky Department of Education

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print Copy Paste

Address <http://aat.ecollege.com/help/preferences.learn?StudentPK=1160&OrgPK=193> Go Links >>

Set Your Preferences

Below are your new preferences:

For Questions

Sample Question: This is how the text for a question will appear on the screen

For Answers

Sample Answers: This is how the text for the answers will appear on the screen

[Change Preferences Again](#)

[Go to Practice Area](#)

[Return to Main Menu](#)

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CATS Online & Universal Design: Multiple Means of Expression

- Student in control of pace and selection of text to be read or re-read
- Student can listen to open response text being read back to make decisions on needed revisions
- Possible use of word prediction to facilitate completion of open response

Student View: Open Response

Question 12 Mathematics - Microsoft Internet Explorer provided by Kentucky Department of Education

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print Copy Paste

Address [https://catsonline.ecollege.com/asmt/section.learn?type=prac&StudentPK_e=9\\$21Dlk4\\$24ID6\\$215Z\\$1345HMe57X\\$12j6d\\$13\\$215k6\\$01b\\$26&OrgPK=38&AsmtPK=2](https://catsonline.ecollege.com/asmt/section.learn?type=prac&StudentPK_e=9$21Dlk4$24ID6$215Z$1345HMe57X$12j6d$13$215k6$01b$26&OrgPK=38&AsmtPK=2) Go Links >>

Number Cubes

José created a game using two number cubes of different colors. The green cube had ODD multiples of 3 and the red cube had EVEN multiples of 3.

- What was the color of the cube that had the number 6?
- List SIX numbers that could be on the OTHER cube.
- Could José design the same game using multiples of 4? Explain your answer.

This question may be answered offline, in your test booklet. Check the checkbox, below, to answer this question offline.

This question will be answered offline, in my test booklet.

You may be allowed to type your answer using Microsoft Word and the writing tools of your reader if that is what you do in the classroom to complete your written work. IF YOU ARE UNSURE WHERE TO PUT YOUR ANSWER, CHECK WITH YOUR TEACHER.

Type in your answer here:

Answer Preview
Save Answer



CATS Online & Universal Design: Multiple Means of Engagement

- Headphones provide auditory engagement and reduce distraction
- Dual-color highlighting of text increases student focus and attention
- Positive student perception of a computer-based accommodation vs. a human accommodation
- Student independence and control increases student efficacy

CATS Online 2005 Post-Test Survey: Student Data



- 78% said they preferred taking the test on computer
- 83% said they could concentrate better reading the test on computer
- 91% of students thought they scored better
- 84% said they re-read passages/questions/answers

CATS Online 2005 Survey: Administrator Data



- 84% said that students were more engaged with the online assessment than with paper version
- 75% said text reader was preferable to human reader
- 65% said students took more time to complete the test on computer using their text reader
- 73% said students re-read test questions more often online than vs. use of human read-aloud



CATS Online

Student Comments

“I liked it alot, because you got to hear them read to you and see what they were reading.” -Gr. 11

“i like being on the computer and not having someone read to me like a kid” -Gr. 10

*“It was easy and I liked it because I could do it by myself.”
-Gr.4*

“It was better than listening to an adult read and I could go at my own pace.” -Gr. 7

CATS Online

Teacher Comments

“I think things went very well and am excited to allow more students to take advantage of this opportunity next year.”

“I am sold on CATS online and use of textreaders. We at [] Middle will participate again next year. This can only help our students and increase our test scores.”

“The students like the fact that the total control over the test is in their hands and that they can work independently and at their own pace.”

“The students seemed to like the fact that they did not have to ask for help to read. The students also seemed to go back and re-read questions more without a human reader.”

2005 CATS ONLINE ASSESSMENT STUDENT DISABILITIES SUMMARY

	Grade								
Population	4	5	7	8	10	11	12	Total	%
Specific Learning Disability	52	73	92	115	60	52	22	466	39
Mild Mental	38	41	77	83	74	72	16	401	33
Other Health Impaired	26	26	62	36	22	16	3	191	16
Emotional Behavioral	6	10	10	22	7	6		61	5
Multiple Disabilities	6	7	11	11	5	1	4	45	4

2005 CATS ONLINE ASSESSMENT STUDENT DISABILITIES SUMMARY

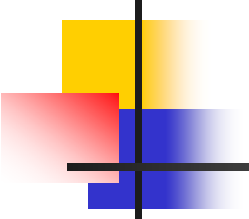
Population	Grade							Total	%
	4	5	7	8	10	11	12		
Autism	1	1	4	2	1			9	1
504 Plan	2	4		1		1		8	1
Traumatic Brain Injury		1	1	3				5	<1
Visually Impaired	1			2		2		5	<1
Hearing Impaired	1			1			1	3	<1
Speech Impaired			1	1			1	3	<1

1 each of Deaf/Blind, Functional Mental and Orthopedic



2005 CATS ONLINE ASSESSMENT SUMMARY OF PARTICIPATION BY GRADE

	Grade 4	Grade 5	Grade 7	Grade 8	Grade 10	Grade 11	Grade 12	
Total	133	164	260	277	169	150	47	
%	11.08	13.67	21.67	23.08	14.08	12.50	3.92	
						Total tested with disabilities		1,200



Impact of a computer-based universally designed assessment on the scores of students with disabilities

- Participating schools reporting improved student test scores
- Longitudinal data analysis of larger student numbers still required to verify impact on student performance
- Issue of determining if improvement in scores is due to accessible test design and or increased student access to general curriculum (UDL)



Student Impact Continued

- Computerized accessible assessment appears to offer a more personalized and user friendly (i.e., UDL) means for students to demonstrate what they have learned
- Use of computerized literacy supports (e.g., text read aloud/platform design) reduces construct-irrelevant barriers (e.g., decoding, multiple questions per page, finding choice on answer sheet)

Lessons learned



- Technology tools must be available school wide and for all students
- Include all stakeholders in process
 - Technology coordinators, special education teachers, ESL/LEP consultants, parents, students, administrators, assessment, instruction,
- Plan big, start small
- Plan for support and follow-up



Other Possible Technology Supports: Representation

- Use of video or audio clips for background or to provide mental models to supplement meaning of selected text
- Hyperlinks to additional information or examples
- Live simulations of tasks (e.g., math operations)



Other Possible Technology Supports: Expression

- Response by selection of symbols/pics or audio
- Use of symbol to text systems for inclusive expression
- Use of speech to text for response instead of scribe



Other Possible Technology Supports: Engagement

- Electronic prompting systems for attending and task completion
- On screen visual and audio reinforcement for correct responses or attending
- Scaffolding of questions and or cues to promote student success



Preview of Kentucky's Online Assessment

- Visit KY Dept of Education web site:
www.education.ky.gov
Enter "CATS Online" in search box
Use sample student login IDs to
preview accessible test items online
- CTBS/McGraw-Hill iKnow
 - <http://www.ctb.com/>
 - Online and Software Solutions



For more information:

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