

**U.S. Department of Education**  
Washington, D.C. 20202-5335



**APPLICATION FOR GRANTS**  
**UNDER THE**

**Enhanced Assessment Instruments Grant Program**

**CFDA # 84.368A**

**PR/Award # S368A170009**

**Grants.gov Tracking#: GRANT12250987**

OMB No. , Expiration Date:

Closing Date: Sep 22, 2016

## **\*\*Table of Contents\*\***

<b>Form</b>	<b>Page</b>
<b>1. Application for Federal Assistance SF-424</b>	e3
<b>2. Standard Budget Sheet (ED 524)</b>	e6
<b>3. Assurances Non-Construction Programs (SF 424B)</b>	e8
<b>4. ED GEPA427 Form</b>	e10
<i>Attachment - 1 (1237-GEPA REQUIREMENT)</i>	e11
<b>5. Grants.gov Lobbying Form</b>	e12
<b>6. Dept of Education Supplemental Information for SF-424</b>	e13
<i>Attachment - 1 (1238-ISMART Human Subjects Research Narrative)</i>	e14
<b>7. ED Abstract Narrative Form</b>	e16
<i>Attachment - 1 (1236-ISMART Abstract)</i>	e17
<b>8. Form Project-V1.1.pdf</b>	e19
<b>9. Form SFLLL-V1.1.pdf</b>	e20
<b>10. Form Budget-V1.1.pdf</b>	e21
<b>11. Form Other-V1.1.pdf</b>	e22
<i>Attachment - 1240-MD ISMART Project Narrative.pdf</i>	e23
<i>Attachment - 1239-MD ISMART Appendices.pdf</i>	e88
<i>Attachment - 1234-MD ISMART Budget Narrative.pdf</i>	e195
<i>Attachment - 1241-MD ISMART Intergovernmental Review.pdf</i>	e214
<i>Attachment - 1235-Indirect Cost Rate Agreement FY16.pdf</i>	e215

This application was generated using the PDF functionality. The PDF functionality automatically numbers the pages in this application. Some pages/sections of this application may contain 2 sets of page numbers, one set created by the applicant and the other set created by e-Application's PDF functionality. Page numbers created by the e-Application PDF functionality will be preceded by the letter e (for example, e1, e2, e3, etc.).

Application for Federal Assistance SF-424		
* 1. Type of Submission: <input type="checkbox"/> Preapplication <input checked="" type="checkbox"/> Application <input type="checkbox"/> Changed/Corrected Application	* 2. Type of Application: <input checked="" type="checkbox"/> New <input type="checkbox"/> Continuation <input type="checkbox"/> Revision	* If Revision, select appropriate letter(s): <input type="text"/> * Other (Specify): <input type="text"/>
* 3. Date Received: <input type="text" value="09/22/2016"/>	4. Applicant Identifier: <input type="text"/>	
5a. Federal Entity Identifier: <input type="text"/>	5b. Federal Award Identifier: <input type="text"/>	
<b>State Use Only:</b>		
6. Date Received by State: <input type="text"/>	7. State Application Identifier: <input type="text"/>	
<b>8. APPLICANT INFORMATION:</b>		
* a. Legal Name: <input type="text" value="Maryland State Department of Education"/>		
* b. Employer/Taxpayer Identification Number (EIN/TIN): <input type="text" value="52-6002033"/>	* c. Organizational DUNS: <input type="text" value="1830714710000"/>	
<b>d. Address:</b>		
* Street1:	<input type="text" value="200 W. Baltimore Street"/>	
Street2:	<input type="text"/>	
* City:	<input type="text" value="Baltimore"/>	
County/Parish:	<input type="text"/>	
* State:	<input type="text" value="MD: Maryland"/>	
Province:	<input type="text"/>	
* Country:	<input type="text" value="USA: UNITED STATES"/>	
* Zip / Postal Code:	<input type="text" value="21201-2595"/>	
<b>e. Organizational Unit:</b>		
Department Name: <input type="text" value="MD State Dept. of Education"/>	Division Name: <input type="text" value="Assessment &amp; Accountability"/>	
<b>f. Name and contact information of person to be contacted on matters involving this application:</b>		
Prefix: <input type="text" value="Ms."/>	* First Name:	<input type="text" value="Martha"/>
Middle Name:	<input type="text"/>	
* Last Name:	<input type="text" value="Torchon"/>	
Suffix:	<input type="text"/>	
Title:	<input type="text" value="Education Program Specialist"/>	
Organizational Affiliation: <input type="text"/>		
* Telephone Number: <input type="text" value="410-767-2498"/>	Fax Number: <input type="text"/>	
* Email: <input type="text" value="martha.torchon@maryland.gov"/>		

**Application for Federal Assistance SF-424**

**\* 9. Type of Applicant 1: Select Applicant Type:**

A: State Government

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

\* Other (specify):

**\* 10. Name of Federal Agency:**

U.S. Department of Education

**11. Catalog of Federal Domestic Assistance Number:**

84.368

CFDA Title:

Grants for Enhanced Assessment Instruments

**\* 12. Funding Opportunity Number:**

ED-GRANTS-080816-001

\* Title:

Office of Elementary and Secondary Education (OESE): Enhanced Assessment Instruments Grant  
Program: Enhanced Assessment Instruments CFDA Number 84.368A

**13. Competition Identification Number:**

84-368A2017-1

Title:

**14. Areas Affected by Project (Cities, Counties, States, etc.):**

Add Attachment

Delete Attachment

View Attachment

**\* 15. Descriptive Title of Applicant's Project:**

Innovations in Science Map, Assessment, and Report Technologies (I-SMART)

Attach supporting documents as specified in agency instructions.

Add Attachments

Delete Attachments

View Attachments

**Application for Federal Assistance SF-424**

**16. Congressional Districts Of:**

\* a. Applicant

\* b. Program/Project

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment

Delete Attachment

View Attachment

**17. Proposed Project:**

\* a. Start Date:

\* b. End Date:

**18. Estimated Funding (\$):**

* a. Federal	<input type="text" value="3,843,805.00"/>
* b. Applicant	<input type="text" value="0.00"/>
* c. State	<input type="text" value="0.00"/>
* d. Local	<input type="text" value="0.00"/>
* e. Other	<input type="text" value="0.00"/>
* f. Program Income	<input type="text" value="0.00"/>
* g. TOTAL	<input type="text" value="3,843,805.00"/>

**\* 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

a. This application was made available to the State under the Executive Order 12372 Process for review on .

b. Program is subject to E.O. 12372 but has not been selected by the State for review.

c. Program is not covered by E.O. 12372.

**\* 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**

Yes  No

If "Yes", provide explanation and attach

Add Attachment

Delete Attachment

View Attachment

**21. \*By signing this application, I certify (1) to the statements contained in the list of certifications\*\* and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances\*\* and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

\*\* I AGREE

\*\* The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

**Authorized Representative:**

Prefix:  \* First Name:

Middle Name:

\* Last Name:

Suffix:

\* Title:

\* Telephone Number:  Fax Number:

\* Email:

\* Signature of Authorized Representative:  \* Date Signed:

**U.S. DEPARTMENT OF EDUCATION  
BUDGET INFORMATION  
NON-CONSTRUCTION PROGRAMS**

OMB Number: 1894-0008  
Expiration Date: 06/30/2017

Name of Institution/Organization

Maryland State Department of Education

Applicants requesting funding for only one year should complete the column under "Project Year 1." Applicants requesting funding for multi-year grants should complete all applicable columns. Please read all instructions before completing form.

**SECTION A - BUDGET SUMMARY  
U.S. DEPARTMENT OF EDUCATION FUNDS**

Budget Categories	Project Year 1 (a)	Project Year 2 (b)	Project Year 3 (c)	Project Year 4 (d)	Project Year 5 (e)	Total (f)
1. Personnel	0.00		0.00	0.00		0.00
2. Fringe Benefits	0.00	0.00	0.00	0.00	0.00	0.00
3. Travel	54.00	54.00	5,860.00	6,092.00		12,060.00
4. Equipment	0.00	0.00	0.00	0.00		0.00
5. Supplies	0.00	0.00	0.00	0.00		0.00
6. Contractual	772,055.00	1,330,823.00	846,801.00	871,472.00		3,821,151.00
7. Construction	0.00	0.00	0.00	0.00		0.00
8. Other	460.00	478.00	498.00	517.00		1,953.00
9. Total Direct Costs (lines 1-8)	772,569.00	1,331,355.00	853,159.00	878,081.00	0.00	3,835,164.00
10. Indirect Costs*	6,819.00	72.00	858.00	892.00		8,641.00
11. Training Stipends						
12. Total Costs (lines 9-11)	779,388.00	1,331,427.00	854,017.00	878,973.00	0.00	3,843,805.00

**\*Indirect Cost Information (To Be Completed by Your Business Office):**

If you are requesting reimbursement for indirect costs on line 10, please answer the following questions:

(1) Do you have an Indirect Cost Rate Agreement approved by the Federal government?  Yes  No

(2) If yes, please provide the following information:

Period Covered by the Indirect Cost Rate Agreement: From:  To:  (mm/dd/yyyy)

Approving Federal agency:  ED  Other (please specify):

The Indirect Cost Rate is  %.

(3) If this is your first Federal grant, and you do not have an approved indirect cost rate agreement, are not a State, Local government or Indian Tribe, and are not funded under a training rate program or a restricted rate program, do you want to use the de minimis rate of 10% of MTDC?  Yes  No If yes, you must comply with the requirements of 2 CFR § 200.414(f).

(4) If you do not have an approved indirect cost rate agreement, do you want to use the temporary rate of 10% of budgeted salaries and wages?  
 Yes  No If yes, you must submit a proposed indirect cost rate agreement within 90 days after the date your grant is awarded, as required by 34 CFR § 75.560.

(5) For Restricted Rate Programs (check one) -- Are you using a restricted indirect cost rate that:

Is included in your approved Indirect Cost Rate Agreement? Or,  Complies with 34 CFR 76.564(c)(2)? The Restricted Indirect Cost Rate is  %.  
PR/Award # S368A170009

Name of Institution/Organization Maryland State Department of Education	Applicants requesting funding for only one year should complete the column under "Project Year 1." Applicants requesting funding for multi-year grants should complete all applicable columns. Please read all instructions before completing form.	
--	---	--

**SECTION B - BUDGET SUMMARY  
NON-FEDERAL FUNDS**

Budget Categories	Project Year 1 (a)	Project Year 2 (b)	Project Year 3 (c)	Project Year 4 (d)	Project Year 5 (e)	Total (f)
1. Personnel						
2. Fringe Benefits						
3. Travel						
4. Equipment						
5. Supplies						
6. Contractual						
7. Construction						
8. Other						
9. Total Direct Costs (lines 1-8)						
10. Indirect Costs						
11. Training Stipends						
12. Total Costs (lines 9-11)						

**SECTION C - BUDGET NARRATIVE (see instructions)**

ED 524

## ASSURANCES - NON-CONSTRUCTION PROGRAMS

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0040), Washington, DC 20503.

**PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.**

**NOTE:** Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the awarding agency. Further, certain Federal awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project cost) to ensure proper planning, management and completion of the project described in this application.
2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the award; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.
3. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.
4. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.
5. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).
6. Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee- 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and, (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.
7. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.
8. Will comply, as applicable, with provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

9. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333), regarding labor standards for federally-assisted construction subagreements.
10. Will comply, if applicable, with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is \$10,000 or more.
11. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).
12. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.
13. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq.).
14. Will comply with P.L. 93-348 regarding the protection of human subjects involved in research, development, and related activities supported by this award of assistance.
15. Will comply with the Laboratory Animal Welfare Act of 1966 (P.L. 89-544, as amended, 7 U.S.C. §§2131 et seq.) pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by this award of assistance.
16. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.
17. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."
18. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.
19. Will comply with the requirements of Section 106(g) of the Trafficking Victims Protection Act (TVPA) of 2000, as amended (22 U.S.C. 7104) which prohibits grant award recipients or a sub-recipient from (1) Engaging in severe forms of trafficking in persons during the period of time that the award is in effect (2) Procuring a commercial sex act during the period of time that the award is in effect or (3) Using forced labor in the performance of the award or subawards under the award.

<p>SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL</p> <p>Michelle Szczepaniak</p>	<p>TITLE</p> <p>State Superintendent of Schools</p>
<p>APPLICANT ORGANIZATION</p> <p>Maryland State Department of Education</p>	<p>DATE SUBMITTED</p> <p>09/22/2016</p>

Standard Form 424B (Rev. 7-97) Back

## NOTICE TO ALL APPLICANTS

OMB Number: 1894-0005  
Expiration Date: 03/31/2017

The purpose of this enclosure is to inform you about a new provision in the Department of Education's General Education Provisions Act (GEPA) that applies to applicants for new grant awards under Department programs. This provision is Section 427 of GEPA, enacted as part of the Improving America's Schools Act of 1994 (Public Law (P.L.) 103-382).

### To Whom Does This Provision Apply?

Section 427 of GEPA affects applicants for new grant awards under this program. **ALL APPLICANTS FOR NEW AWARDS MUST INCLUDE INFORMATION IN THEIR APPLICATIONS TO ADDRESS THIS NEW PROVISION IN ORDER TO RECEIVE FUNDING UNDER THIS PROGRAM.**

(If this program is a State-formula grant program, a State needs to provide this description only for projects or activities that it carries out with funds reserved for State-level uses. In addition, local school districts or other eligible applicants that apply to the State for funding need to provide this description in their applications to the State for funding. The State would be responsible for ensuring that the school district or other local entity has submitted a sufficient section 427 statement as described below.)

### What Does This Provision Require?

Section 427 requires each applicant for funds (other than an individual person) to include in its application a description of the steps the applicant proposes to take to ensure equitable access to, and participation in, its Federally-assisted program for students, teachers, and other program beneficiaries with special needs. This provision allows applicants discretion in developing the required description. The statute highlights six types of barriers that can impede equitable access or participation: gender, race, national origin, color, disability, or age. Based on local circumstances, you should determine whether these or other barriers may prevent your students, teachers, etc. from such access or participation in, the Federally-funded project or activity. The description in your application of steps to be taken to overcome these barriers need not be lengthy; you may provide a clear and succinct description of how you plan to address those barriers that are applicable to your circumstances. In addition, the information may be provided in a single narrative, or, if appropriate, may

be discussed in connection with related topics in the application.

Section 427 is not intended to duplicate the requirements of civil rights statutes, but rather to ensure that, in designing their projects, applicants for Federal funds address equity concerns that may affect the ability of certain potential beneficiaries to fully participate in the project and to achieve to high standards. Consistent with program requirements and its approved application, an applicant may use the Federal funds awarded to it to eliminate barriers it identifies.

### What are Examples of How an Applicant Might Satisfy the Requirement of This Provision?

The following examples may help illustrate how an applicant may comply with Section 427.

(1) An applicant that proposes to carry out an adult literacy project serving, among others, adults with limited English proficiency, might describe in its application how it intends to distribute a brochure about the proposed project to such potential participants in their native language.

(2) An applicant that proposes to develop instructional materials for classroom use might describe how it will make the materials available on audio tape or in braille for students who are blind.

(3) An applicant that proposes to carry out a model science program for secondary students and is concerned that girls may be less likely than boys to enroll in the course, might indicate how it intends to conduct "outreach" efforts to girls, to encourage their enrollment.

(4) An applicant that proposes a project to increase school safety might describe the special efforts it will take to address concern of lesbian, gay, bisexual, and transgender students, and efforts to reach out to and involve the families of LGBT students.

We recognize that many applicants may already be implementing effective steps to ensure equity of access and participation in their grant programs, and we appreciate your cooperation in responding to the requirements of this provision.

### Estimated Burden Statement for GEPA Requirements

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless such collection displays a valid OMB control number. Public reporting burden for this collection of information is estimated to average 1.5 hours per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. The obligation to respond to this collection is required to obtain or retain benefit (Public Law 103-382). Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the U.S. Department of Education, 400 Maryland Ave., SW, Washington, DC 20210-4537 or email [ICDocketMgr@ed.gov](mailto:ICDocketMgr@ed.gov) and reference the OMB Control Number 1894-0005.

**Optional - You may attach 1 file to this page.**

GEPA\_REQUIREMENT.pdf

Add Attachment

Delete Attachment

View Attachment

## GEPA REQUIREMENT

The Maryland State Department of Education ensures equitable access to, and participation in, its Federally-assisted program for students, teachers, and other program beneficiaries with special needs. There are implicit and explicit processes and procedures to ensure equal access and treatment of project participants who are groups that have been underrepresented, based on race, color, national origin, gender, age or disability. Some of the specific processes and procedures include:

- All prospective attendees are from schools and participation organizations that will have access to outreach materials, training supplements, etc. MSDE will make specific outreach efforts that target underrepresented populations in the training.
- All MSDE materials are available in alternative formats for special needs populations
- MSDE will provide technical expertise to ensure special needs and diverse populations are addressed through implementation
- The curriculum and instructional materials will be evaluated based on diversity and underrepresented populations.
- The schools targeted by the grant are low performing and located in poverty areas.

## CERTIFICATION REGARDING LOBBYING

### Certification for Contracts, Grants, Loans, and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

### Statement for Loan Guarantees and Loan Insurance

The undersigned states, to the best of his or her knowledge and belief, that:

If any funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this commitment providing for the United States to insure or guarantee a loan, the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in accordance with its instructions. Submission of this statement is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required statement shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

<b>* APPLICANT'S ORGANIZATION</b> Maryland State Department of Education	
<b>* PRINTED NAME AND TITLE OF AUTHORIZED REPRESENTATIVE</b>	
Prefix: Dr.	* First Name: Karen Middle Name: B.
* Last Name: Salmon	Suffix:
* Title: State Superintendent of Schools	
<b>* SIGNATURE:</b> Michelle Szczepaniak	<b>* DATE:</b> 09/22/2016

U.S. DEPARTMENT OF EDUCATION  
SUPPLEMENTAL INFORMATION  
FOR THE SF-424

**1. Project Director:**

Prefix: Ms.	First Name: Martha	Middle Name:	Last Name: Torchon	Suffix:
----------------	-----------------------	--------------	-----------------------	---------

Address:

Street1:	200 W. Baltimore Street
Street2:	
City:	Baltimore
County:	
State:	MD: Maryland
Zip Code:	21201
Country:	USA: UNITED STATES

Phone Number (give area code) 410-767-0298	Fax Number (give area code)
---	-----------------------------

Email Address:  
martha.torchon@maryland.gov

**2. Novice Applicant:**

Are you a novice applicant as defined in the regulations in 34 CFR 75.225 (and included in the definitions page in the attached instructions)?  
 Yes  No  Not applicable to this program

**3. Human Subjects Research:**

a. Are any research activities involving human subjects planned at any time during the proposed Project Period?

Yes  No

b. Are ALL the research activities proposed designated to be exempt from the regulations?

Yes Provide Exemption(s) #:  1  2  3  4  5  6

No Provide Assurance #, if available: FWA00003310

c. If applicable, please attach your "Exempt Research" or "Nonexempt Research" narrative to this form as indicated in the definitions page in the attached instructions.

ISMART Human Subjects Research Narrative.pdf	Add Attachment	Delete Attachment	View Attachment
--	----------------	-------------------	-----------------

**Innovations in Science Map, Assessment and Report Technologies (I-SMART)**  
**Human Subjects Nonexempt Research Narrative**  
**CFDA 84.368A**

**(1) Human subjects involvement and characteristics:**

The I-SMART project focuses on developing a new educational assessment system for students with disabilities. For research purposes, participants will include students with significant cognitive disabilities (SCD) who are eligible to take alternate assessments, students with other types of disabilities and who are low achieving in science, student without disabilities who perform below grade level in science, parents, and teachers who provide science instruction to those students. There are three interrelated research goals for the development of the I-SMART science learning map model, assessments, and score reporting dashboard. In 2017 for Goal 1, 9 teachers will participate in external review of learning map models. In 2018 for Goal 2, 6-8 students (in grades 5-12) and their teachers will participate in cognitive lab tryouts of prototype science testlets (short assessments) to provide information about usability, feasibility, and fidelity of implementation. In 2019, for Goal 2, 4,500 students and their teachers will participate in pilot testing of testlets. In 2017 for Goal 3, 15 teachers, district staff and parents/guardians will participate in a needs assessment for the score reporting dashboard. In 2020, for Goal 3, up to 16 teachers will participate in usability testing for the score reporting dashboard. The only exclusion criteria for teachers are (1) teachers who participate in the pilot cannot have been involved in the prototype tryouts, (2) teachers who participate in the pilot or tryouts cannot have been involved in developing the innovative testlets, and (3) teachers who participate in the usability testing of the dashboard cannot have participated in the needs assessment. There are no exclusion criteria for students.

**(2) Sources of materials:**

In Goal 1, content specialists will complete external reviews of learning map materials. In Goal 2, students and their teachers will participate in cognitive lab tryouts of testlets. Also in Goal 2, student data will be collected from pilot administration of testlets. In Goal 3, teachers, parents and students will participate in a needs assessment and teachers will complete surveys after dashboard use on demographics and dashboard usability. Goal 3 student-level data includes results on pilot science assessments for use in designing automated scoring. All data will be obtained specifically for research purposes.

**(3) Recruitment and informed consent:**

For each research Goal the first stage of recruitment is at the state level. Once states have volunteered, state representatives will distribute recruitment information to all eligible participants. The recruitment information will describe the purpose of the study and the elements of participation. In Goal 1, reviewers will be provided information about the external review task and provide consent via a signed consent form. In Goal 2, consent will be obtained from teachers for item tryouts via a signed consent form. Parents will provide a signed consent form for student participation. Teachers and parents will be informed of the purpose of the study and the elements of participation for item tryouts. Video/audio recording consent may be obtained for item tryouts. In Goal 2 for pilot testing, teachers will be recruited for participation. Teachers and students will participate as part of routine instructional practice. Teachers and parents of students participating in the pilot will receive informational letters that describe the pilot study. In Goal 3,

needs assessment focus group and usability study participants will be recruited by states and provide consent for participation via a signed consent form.

**(4) Potential risks:**

There are no foreseeable psychological, physical, economic, or legal risks for the proposed studies. All research activities support development of science assessments that may be used for routine educational purposes. The assessment system is designed to be fully accessible to students with significant cognitive disabilities and to measure science achievement. There is minimal risk of psychological or social harm in the event of confidentiality breach involving data collected for research purposes.

**(5) Protection against risk:**

Confidentiality of teachers, students, schools, and districts will be protected by assigning identification numbers and removing identifying information from records. Only the research staff at KU will have access to the records that connect teachers, students, schools, and districts to identification numbers and these records will be kept in a secure location. Images of teachers and students will not be used in public dissemination unless all parties in a video have provided consent for their public use for this purpose.

**(6) Importance of the knowledge to be gained:**

The I-SMART project will evaluate the effectiveness of a system consisting of a new cognitive learning map model, innovative assessments, and score reporting dashboard in meeting this demand. Science achievement expectations for students with SCD are increasing and there is evidence that current learning models, assessments and score reporting tools can be improved.

**(7) Collaborating site(s):**

Teachers will be recruited through their districts and the I-SMART system will be used at specific sites within participating states. Data will be collected on site during Goals 2 and 3. Research will take place at districts in five states. Collaborating sites include districts in Maryland, Missouri, New Jersey, New York, and Oklahoma.

## Abstract

The abstract narrative must not exceed one page and should use language that will be understood by a range of audiences. For all projects, include the project title (if applicable), goals, expected outcomes and contributions for research, policy, practice, etc. Include population to be served, as appropriate. For research applications, also include the following:

- Theoretical and conceptual background of the study (i.e., prior research that this investigation builds upon and that provides a compelling rationale for this study)
- Research issues, hypotheses and questions being addressed
- Study design including a brief description of the sample including sample size, methods, principals dependent, independent, and control variables, and the approach to data analysis.

[Note: For a non-electronic submission, include the name and address of your organization and the name, phone number and e-mail address of the contact person for this project.]

---

## You may now Close the Form

**You have attached 1 file to this page, no more files may be added. To add a different file, you must first delete the existing file.**

\* Attachment:

## **Innovations in Science Map, Assessment, and Report Technologies (I-SMART)**

**Project Objectives and Activities:** Next Generation Science Standards (NGSS) reflect high expectations for students and are based on a multidimensional model of learning science. As states adopt the NGSS, high-quality assessments are needed to measure student learning of more rigorous standards and provide timely and useful feedback about student performance. I-SMART's ultimate goal is to maximize science achievement and progress across grades for students with significant cognitive disabilities (SCD) who take alternate assessments and for students with or without disabilities who are not yet meeting grade-level standards.

***Goal 1: Develop and evaluate a learning map model for science.*** The project will build on existing local neighborhood maps around science grade-level targets for students with SCD by integrating science map neighborhoods with a multidisciplinary learning map that includes knowledge and skills in English language arts and mathematics. Activities include developing and evaluating the learning map model.

***Goal 2: Design, develop, and evaluate assessments that incorporate science disciplinary content and science and engineering practices in highly engaging, universally designed, technology-delivered formats.*** Using an evidence-centered design approach, we will develop testlets (short assessments) that measure students' knowledge and skills in science content aligned to the learning map. Universal Design for Learning principles will be incorporated to maximize student engagement and minimize barriers. After prototyping innovative items and testlets and receiving stakeholder input, refined testlets will be externally reviewed, pilot tested, and evaluated for their potential to support reliable, valid, and fair assessment.

***Goal 3: Design, develop, and evaluate a dashboard that provides diagnostic feedback based on student performance on science assessments.*** Using iterative prototype designs and with input

from stakeholders, we will develop a reporting dashboard that provides feedback on individual student performance on the new testlets. Using information from the learning maps and connections with other content areas, results will support teaching, learning, and communication with parents. The dashboard will include recommendations for instruction and embed just-in-time assessment literacy supports to facilitate appropriate interpretations and uses of results.

**Goal 4: *Broadly disseminate project materials and findings to a variety of audiences.*** The project's dissemination plan includes dissemination of materials and products developed in goals 1-3, lessons learned during the design process, and research outcomes to stakeholder organizations, educators in the field, professional organizations, researchers, and policy makers.

**Priorities:** I-SMART addresses all four absolute priorities and competitive preference priorities 1(a&c) and 2(a&c). The project will be in *collaboration* with five states (Maryland-lead, Missouri, New York, New Jersey, Oklahoma), the University of Kansas Center for Educational Testing and Evaluation, CAST, and BYC Consulting to produce assessments and materials to support *comprehensive alternate assessments* that include *multiple measures of student progress over time*. The project delivers *innovative science assessments* and *score reports that improve the utility of information about student performance*. I-SMART includes a comprehensive *dissemination plan* for materials, processes, and results.

**Outcomes:** The science learning map model includes multiple pathways for students to learn science and reach challenging grade-level expectations. Assessments aligned to the learning map model will measure student learning. The reporting dashboard would be appropriate for within-year uses and may also be useful for fine-grained reporting of summative results.

**Participants & sites:** Approximately 4,500 students and their teachers across the partner states.

## Project Narrative File(s)

---

\* **Mandatory Project Narrative File Filename:**

[Add Mandatory Project Narrative File](#)

[Delete Mandatory Project Narrative File](#)

[View Mandatory Project Narrative File](#)

---

To add more Project Narrative File attachments, please use the attachment buttons below.

[Add Optional Project Narrative File](#)

[Delete Optional Project Narrative File](#)

[View Optional Project Narrative File](#)

# DISCLOSURE OF LOBBYING ACTIVITIES

Complete this form to disclose lobbying activities pursuant to 31 U.S.C.1352

Approved by OMB  
0348-0046

<b>1. * Type of Federal Action:</b> <input type="checkbox"/> a. contract <input checked="" type="checkbox"/> b. grant <input type="checkbox"/> c. cooperative agreement <input type="checkbox"/> d. loan <input type="checkbox"/> e. loan guarantee <input type="checkbox"/> f. loan insurance	<b>2. * Status of Federal Action:</b> <input type="checkbox"/> a. bid/offer/application <input checked="" type="checkbox"/> b. initial award <input type="checkbox"/> c. post-award	<b>3. * Report Type:</b> <input checked="" type="checkbox"/> a. initial filing <input type="checkbox"/> b. material change
--	--	--

**4. Name and Address of Reporting Entity:**  
 Prime     SubAwardee

\* Name:

\* Street 1:     Street 2:

\* City:     State:     Zip:

Congressional District, if known:

**5. If Reporting Entity in No.4 is Subawardee, Enter Name and Address of Prime:**

<b>6. * Federal Department/Agency:</b> <input type="text" value="N/A"/>	<b>7. * Federal Program Name/Description:</b> <input type="text" value="Grants for Enhanced Assessment Instruments"/> CFDA Number, if applicable: <input type="text" value="84.368"/>
--	---

<b>8. Federal Action Number, if known:</b> <input type="text"/>	<b>9. Award Amount, if known:</b> \$ <input type="text"/>
--	--

**10. a. Name and Address of Lobbying Registrant:**

Prefix  \* First Name  Middle Name

\* Last Name  Suffix

\* Street 1:     Street 2:

\* City:     State:     Zip:

**b. Individual Performing Services** (including address if different from No. 10a)

Prefix  \* First Name  Middle Name

\* Last Name  Suffix

\* Street 1:     Street 2:

\* City:     State:     Zip:

**11.** Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when the transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

\* Signature:

\* Name: Prefix  \* First Name  Middle Name   
\* Last Name  Suffix

Title:  Telephone No.:  Date:

<b>Federal Use Only:</b>	Authorized for Local Reproduction Standard Form - LLL (Rev. 7-97)
--------------------------	--

PR/Award # S368A170009

## Budget Narrative File(s)

---

\* **Mandatory Budget Narrative Filename:**

[Add Mandatory Budget Narrative](#)

[Delete Mandatory Budget Narrative](#)

[View Mandatory Budget Narrative](#)

---

To add more Budget Narrative attachments, please use the attachment buttons below.

[Add Optional Budget Narrative](#)

[Delete Optional Budget Narrative](#)

[View Optional Budget Narrative](#)

## Other Attachment File(s)

---

\* Mandatory Other Attachment Filename:

[Add Mandatory Other Attachment](#)

[Delete Mandatory Other Attachment](#)

[View Mandatory Other Attachment](#)

---

To add more "Other Attachment" attachments, please use the attachment buttons below.

[Add Optional Other Attachment](#)

[Delete Optional Other Attachment](#)

[View Optional Other Attachment](#)

**Project Narrative Contents**

**(A) NEED FOR THE PROJECT ..... 2**

**(B) SIGNIFICANCE..... 5**

**(C) QUALITY OF THE PROJECT DESIGN..... 18**

**(D) QUALITY OF PROJECT SERVICES..... 38**

**(E) QUALITY OF PROJECT PERSONNEL ..... 39**

**(F) ADEQUACY OF RESOURCES..... 50**

**(G) MANAGEMENT PLAN..... 54**

**(H) QUALITY OF THE PROJECT EVALUATION..... 59**

**(I) STRATEGY TO SCALE..... 62**

### **Innovations in Science Map, Assessment, and Report Technologies (I-SMART)**

The Maryland State Department of Education is pleased to propose Innovations in Science Map, Assessment, and Reporting Technology (I-SMART). The project's ultimate goal is to maximize science achievement and progress across grades for students with significant cognitive disabilities (SCD) who take alternate assessments (AA-AAS) and for students with or without disabilities who are not yet meeting rigorous grade-level standards. I-SMART addresses all four absolute priorities and two competitive preference priorities: 1(a&c) and 2(a&c). The project is a *collaboration* with five states (MD, MO, NJ, NY, OK), the University of Kansas Center for Educational Testing and Evaluation (CETE), CAST, and BYC Consulting to produce materials to support *comprehensive assessments* that include *multiple measures of student progress over time*. The project delivers *innovative assessments in science* and *score reports that improve the utility of information about student performance*. I-SMART also includes a comprehensive *dissemination plan* for materials, processes, and results.

#### **(A) NEED FOR THE PROJECT**

Although science education reform has been a national concern for decades, little improvement has been observed in K-12 instructional practices or science achievement (DeBoer, 2014). Previous national science standards (e.g., National Research Council 1996; 2012) called for increased emphasis on science and teaching improvements, yet science achievement declined from 1995 to 2011 (NCES, 2016). Lower K-12 science achievement is associated with poor postsecondary outcomes, meaning there are fewer citizens qualified to fill positions in science and engineering occupations (NSF, 2014). According to a 2011 report, the U.S. education system “is not producing enough STEM-capable students to keep up with demand both in traditional

STEM occupations and other sectors across the economy...that demand similar competencies" (Carnevale, Smith, & Melton, 2011).

The recent publication of the *Next Generation Science Standards* (NGSS; NGSS Lead States, 2013) and their subsequent adoption by numerous states (including several involved in I-SMART) marked an increase in science achievement expectations for all students. To be prepared for success in postsecondary settings and to be scientifically literate citizens, students are expected to demonstrate complex, multidimensional science knowledge and skills.

There are likely to be barriers to high student achievement of the NGSS. While there has been some research on how students learn science (e.g., AAAS maps, learning progressions research), these models vary widely and most do not support the multi-dimensional emphasis within the NGSS. Current models neither represent multiple pathways by which students learn science nor the flexibility necessary to be effective for diverse learners, such as through Universal Design for Learning (UDL; Rose & Meyer, 2000). Current views of learning indicate that science concepts develop over years through many cognitive reorganizations. Yet there is a large gap between the scope of the expectations of the NGSS and those of the science concepts and inquiry practices represented by existing learning models.

The historic pattern of science achievement has been attributed to several instructional factors, such as the use of science instructional strategies that emphasize factual knowledge and lower-level skills, and instructional time. The increased focus on high-stakes tests in the No Child Left Behind Act (2001) resulted in a 33% reduction in the time allocated for science instruction in elementary school because science was not tested every year while ELA and math were tested annually (Berliner, 2011). Content has been assigned to grade levels according to tradition rather than cognitive models, resulting in curricular sequences that fail to provide the

experiences and time that students need to develop understanding of complex concepts (Smith & Wisner, 2014). A few science education researchers have published resources (e.g. Abell & Volkman, 2006; Keeley, 2014) to support instructionally useful assessment of science understanding, but it is still often up to individual teachers to implement formative assessments and find resources (Black & Atkin, 2014).

Active science learning requires students to develop and simultaneously use a number of complex skills (e.g., read, use math, have content knowledge, have procedural knowledge, apply scientific reasoning) in order to apply skills now evident in the NGSS science and engineering practices (McNeill & Krajcik, 2006; NRC, 2000; Sandoval & Reiser, 2004).

To support students in meeting the NGSS expectations, science assessments also need improvement. Unlike recently federally-funded consortia that developed new general and alternate assessments in English language arts (ELA) and mathematics, there has not yet been significant investment in designing next generation science assessments. New assessments must be based on the new representation of science content and extend the recent developments in online assessment for all populations, such as lessons learned about efficiency (i.e., quality of information versus assessment burden) and comprehensive approaches to reduce construct-irrelevant variance through UDL (Dolan et al., 2005; 2013).

Three populations are especially likely to face challenges with the transition to NGSS: students with significant cognitive disabilities (SCD) who are eligible for alternate assessments based on alternate academic achievement standards (AA-AAS); students with disabilities who perform significantly below grade level but are not eligible for AA-AAS; and students without disabilities who perform significantly below grade level. These populations will need highly

effective instruction and assessment designed within the UDL framework in order to engage with more challenging grade-level content and attain higher achievement.

Although standards and policy documents tout high standards for science achievement and increased emphases on science, these higher expectations have not yet been realized. Large populations of students with and without disabilities have poor science achievement and limited access high quality science instruction (Fealing, Lai, & Myers, 2015). Despite three decades of federal initiatives aimed at broadening participation, the reality remains that many girls, racial and ethnic minorities, and students with disabilities have limited access to and success in STEM, and do not choose STEM majors (Hemphill & Vanneman, 2011). Without significant attention, the NGSS could actually increase access and achievement gaps (Reardon, 2011). Improving student progress and attaining higher expectations will require innovations in assessment design and score reports that support teachers in making valid inferences and appropriate uses of the results to improve instruction. The I-SMART project addresses each of these areas.

## **(B) SIGNIFICANCE**

### **1. Significance of the problem**

Historically, science content has been presented as a collection of facts with little attention to deep understanding of concepts or integration of science practices (DeBoer, 2014; NGSS Lead States, 2013). This approach reflects a one-dimensional view that is not best practice for teaching or learning science (NGSS Lead States, 2013). Fragmentation of science knowledge has been reinforced by assessment practices. Most classroom, district and state science assessments “remain disconnected, assessing discrete facts and few science practices” Britton & Schneider (2014, p. 804). The No Child Left Behind Act (NCLB, 2001) required that by 2007 states must develop standards and assessments in science and that science must be assessed three times:

during grades 3-5, grades 6-9, and grades 10-12 (U.S. Department of Education, 2003, 2004, 2007). A 2016 review of states' websites revealed that many states chose to minimally comply with these requirements by testing for science once within each grade band.

In 2012 *A Framework for K-12 Science Education* (National Research Council, 2012) introduced a new model of science with three dimensions: *disciplinary core ideas*, *science and engineering practices*, and *crosscutting concepts*. The Framework shifts the emphasis from presenting scientific inquiry as a separate topic to a routine application of science and engineering practices as students explore and demonstrate understanding of concepts. The science and engineering practices overlap with and provide opportunities to build on literacy and mathematics content, such as constructing arguments from evidence and mathematical modeling (Stage, Asturias, Cheuk, Daro, & Hampton, 2013).

The differences between the NGSS, which are based on the Framework, and previous standards, reflect this transition to three-dimensional content. For example, the 1996 standards provide this physical science objective for elementary school: "...develop an understanding of properties and objects of materials" (National Research Council, 1996, p. 108). The 2013 NGSS provides this comparable physical science standard for the same grade level: "Make observations and measurements to identify materials based on their properties (NGSS Lead States, 2013, p. 43)." Multidimensionality increases the complexity and difficulty of science content standards, requiring students to use higher-order cognitive processes.

To meet the NGSS expectations, students must learn to apply science concepts in different contexts to solve problems and demonstrate conceptual understanding, and learn science vocabulary. Science instruction has previously centered on teaching discrete facts to be memorized without emphasis or effort on connecting concepts and constructing knowledge from

experience (DeBoer, 2014) There is research on learning progressions in science (Alonzo & Gotwals, 2012; Corcoran, Mosher, & Rogat, 2009), designed to represent targeted skills and subsequent prerequisite concepts or learning experiences that are important in developing conceptual understanding. However, this is an emerging field of research that needs further attention. Learning progressions currently exist in varying stages of development for a limited number of science topics (Corcoran, Mosher, & Rogat, 2009; Rogat, 2011). Additional learning models are needed to address all content in new NGSS-based standards and to support a new generation of science assessments.

Recent changes to state standards, curriculum, and assessment demonstrate a convergence on a multidimensional model of science learning (Pellegrino, 2012). Yet there is evidence that some students, particularly low-performing students and those with SCD, are unprepared for this new model. Science instruction for these populations reflect even lower expectations and more limited access than for typical general education students.

A survey of teachers in five states conducted in 2007 (the first year science AA-AAS was required) indicated there was limited coverage of science in instruction for students with SCD (Karvonen, Wakeman, Browder, & Flowers, 2011). By 2015, a survey conducted in 5 states that used NGSS-aligned alternate content standards for students with SCD indicated that very few students consistently used the science and engineering practices during instruction. Using a typical threshold for student mastery of instructional goals (demonstrating a skill 80% of the time), only 15% of students were reportedly able to sort objects or materials by common properties. Far fewer were able to recognize patterns (7%), identify similarities and differences (5%), use data to answer questions (2%), identify cause and effect relationships (2%), or identify

evidence that supports a claim (1%; Andersen & Bechard, 2016). These figures are considerably lower than similar survey findings on ELA and mathematics skills (Nash et al., 2015).

**Large-Scale Science Assessments for Students with Disabilities.** The creation of valid, reliable, and fair educational assessments for students with disabilities has a short history. The 1994 reauthorization of the Elementary and Secondary Education Act (i.e., Improving America's Schools Act; IASA) required states to set challenging academic content and performance standards for all children and to use state assessments to measure their performance on the standards. Since IDEA 1997, all students with disabilities have been expected to have access to the general curriculum and to demonstrate their achievement on large-scale academic assessments (with or without accommodations or on alternate assessments). Regulations issued under NCLB in 2003 specified further that students with SCD are allowed to use alternate assessments based on alternate academic achievement standards (AA-AAS), followed by additional regulations in 2007 that allowed another group of low-performing students with disabilities to demonstrate their achievement on alternate assessments based on modified achievement standards (AA-MAS; rescinded in 2015). In this 20+ year span, many approaches to assessment design have been tried, in order to discover the best methods to ensure results that can be interpreted meaningfully for this very heterogeneous group of students.

Students with SCD who are eligible for AA-AAS comprise about 9% of the population of students with disabilities and about 1% of the overall student population. In a census study on nearly 45,000 students with SCD (Nash et al., 2016), a majority of students read at the first grade level or below (60%), and were taught primarily in separate classrooms from their grade-level peers (68%), and 24% of students did not use expressive speech to communicate. The impact of these characteristics on test design has been profound. AA-AAS assessments tend to be

administered individually, and allow maximum flexibility that results in intended variability of learning targets and assessment methods (Gong & Marion, 2006). These students' intellectual challenges necessitate short testing sessions, simplified vocabulary, and reduction of reliance on short-term memory. A variety of formats were developed to address these characteristics, including portfolios, performance tasks, and checklists (Roeber, 2002).

The general concern about unidimensional, fragmented science content and assessment for all students has also been noted in AA-AAS. In a review of 2014-15 science AA-AAS Rogers et al. (2015) found that at the elementary level, almost all states included life science on their AA-AAS and many also included earth and space science and physical science. By high school, there was evidence that many states no longer assessed earth and space science or physical science. While states developed their science AA-AAS based on a variety of resources (e.g., NGSS, National Science Education Standards, state-developed standards) the degree to which specific domains were assessed across grade levels within any one state's set of AA-AAS varied.

Another group of students who are likely to be unprepared for higher science expectations are students who previously participated in AA-MAS. Describing these students and considering their characteristics when designing assessments proved to be difficult. In a review of 14 federally funded studies focusing on AA-MAS from 2006-2010, the editors concluded that, "There is still not consensus on who the students are who are candidates to participate in an AA-MAS and how to precisely identify them, but there is consensus that there is a group of struggling learners who have difficulty accessing both instruction and assessments" (Thurlow, Lazarus, & Bechard, eds. 2013, p. 418). The studies identified a variety of cognitive characteristics these students exhibit, including difficulties with abstract, inferential, or symbolic thinking; multi-step problems; grade level vocabulary, especially words with multiple meanings

and technical terms; receptive or expressive language skills; and short-term or working memory capacities. Thurlow et al. found that a variety of strategies were used to modify tests or assessment items for AA-MAS, with the goal of creating assessments aligned to grade-level content standards that were reduced in cognitive complexity. Approaches included changing the items in various ways or changing the test itself, adjusting format characteristics or content, and thinking through the cognitive load of items and how that load might be reduced. Specific strategies included: adding visuals, graphic organizers, or hint boxes, bolding, underlining, chunking text, changing or eliminating distractors, increasing white space, simplifying language, and enhancing directions. Every study examined packages of changes rather than only a single change.

**Designing Next-Generation Science Assessments.** The transition to more complex science content increases challenges in developing high-quality assessments that engage students' higher-order thinking skills without introducing accessibility barriers. Lessons learned from previous AA-AAS and AA-MAS research, and from more recent assessment consortia, may inform the design of NGSS-aligned science assessments for students with SCD and those who were formerly eligible for AA-MAS. Promising practices include the use of **Evidence-Centered Design** (ECD) and the **Universal Design for Learning** (UDL) Framework. ECD process provides language, concepts, and knowledge representations for designing and delivering educational assessments, all organized around an evidentiary argument (Mislevy, Steinberg, & Almond, 2003). UDL provides a framework for making assessments that are accessible. Three broad principles provide the framework for the UDL guidelines. **Multiple Means of Engagement** (the why of learning) denotes supporting interest, motivation, and persistence. Just as students learn more effectively when they are engaged and motivated, their ability to

demonstrate their learning on assessments can be enhanced by increasing engagement. **Multiple Means of Representation** (the what of learning) denotes presenting information and content in different ways and making connections between them. In assessments, the ways in which the items are presented—text, graphs, charts, images, videos, demonstrations, objects to manipulate—can have a significant impact on how a student performs on an item, or an entire assessment. **Multiple Means of Action and Expression** (the how of learning) denotes providing different ways for students to work with information and content and to demonstrate what they are learning. In assessments, providing flexible options for ways in which learners can express their construct-relevant skills, knowledge, and understandings (KSUs) results in more accurate assessment results.

The UDL framework has become increasingly prominent in national (and international) educational policy and practice and has been used by assessment consortia in assessment design since 2010. Just within the last year, the UDL framework has been featured in the National Educational Technology Plan (OET, 2016), the Educational Technology Developer’s Guide (OET, 2015) and especially in the recent Every Student Succeeds Act (ESSA, 2015). The recent prominence of UDL reflects the increasingly widespread recognition that the UDL principles and guidelines (CAST, 2011; Rose & Gravel, 2013) can guide developers to create educational systems that are more equitable and effective for all learners. That recognition has multiple substantive roots: in theory (Meyer, Rose, & Gordon, 2014, Rappolt-Schlichtmann et al, 2013); in practice (Novak, 2014; Nelson & Rose, 2014; Hall, Meyer, & Rose, 2012); and in research (Rappolt-Schlichtmann & Daley, 2013; Reich, Price, Rubin, & Steiner, 2010; Rappolt-Schlichtmann et al., 2013; Daley, Hillaire, & Sutherland, 2014). A framework and guidelines for applying UDL principles specifically to computer-based testing—and technology-enhanced

items in particular—have been developed (Dolan et al., 2007, 2013). The goal of UDL in assessment is to improve construct validity by (1) reducing construct-irrelevant variance inherent in fixed-form, inflexible tests, (2) reducing the introduction of new sources of construct-irrelevant variance piggy-backing on novel interfaces, and (3) reducing construct underrepresentation by expanding the depth of KSUs that can be evaluated.

Another recent innovation is computer-based testing. Computer-based tests are useful for many reasons and can be especially helpful in mathematics and science for students who require that text be read aloud, as complex vocabulary can be represented more consistently (Russell et al., 2010). Computer-based testing has the added benefit of implementing standardized accessibility features across administrations, ensuring all students have access to high quality assessments (Almond, et al., 2010). Additionally, computer-based tests provide means for automated scoring and more immediate reporting information. Research supports that computer-based, interactive tests allow for the assessment of more complex reasoning skills (DeBoer et al., 2014) and can be useful for measuring students' knowledge and skills on complex science tasks. Yet the implementation of complex performance-based tasks via computer are still limited.

Two large consortia (Dynamic Learning Maps, DLM; and the National Center and State Collaborative, NCSC) have developed computer-based AA-AAS in ELA and mathematics. The emergence of computer-based AA-AAS has expanded the research on assessment design in new directions. The DLM project developed computer-delivered **testlets**, short groups of items that share a context and engagement activity, that can be dynamically routed based on the appropriate difficulty level required by the student. The DLM approach to computer based testing includes accessibility tools available to all students with other supports outside the system allowing for

multiple combinations of allowable supports that are determined by test administrators and IEP teams based on individual student needs.

Until recently science AA-AAS has been largely specific to individual states. One exception is the DLM Science Consortium, which began operational science assessment in eight states in 2015-16. DLM science assessments meet many of the challenges of assessing students with SCD in science. Essential Elements in Science were developed in 2014 based on the NGSS, and reflecting high expectations for students with SCD. The EEs reflect the multidimensional content of the NGSS. The DLM approach to assessment design integrates ECD and UDL to meet the needs of diverse student populations. Testlets are delivered at three levels of complexity, or **linkage levels**. The target level testlets assess the EE, with precursor and initial level testlets assessing content connected to the EE at a reduced level of complexity. Results were based on diagnostic classification modeling to provide fine-grained information about skills mastered as well as overall science achievement. Current DLM science development includes building a learning map model to support progressions of multi-dimensional content around the EEs. These **neighborhood maps** will support new science assessments at different levels of complexity in the future.

While current DLM science assessments meet summative testing needs, the system does not yet fully support ongoing instruction and student progress within and across years. Embedded science assessments, available at every grade, can help teachers monitor student science progress, provide feedback to inform teaching, and potentially improve science learning outcomes. However, strengthening the relationship between assessment and instruction requires several innovations. First teachers need deeper content knowledge and pedagogical content knowledge for providing instruction in multidimensional science content. Most current teachers

of students with SCD completed preservice preparation programs that emphasized exposure to science rather than science understanding (Browder & Spooner, 2014; Leko, Brownell, Sindelar, & Kiely, 2015). Preservice programs have typically required little science education coursework, as special educators may be considered population specialists and content generalists (e.g., Conderman, Johnston-Rodriguez, Hartman, & Kemp, 2013). Teachers struggle with—and have less confidence in and self-efficacy around—their understanding of and ability to teach science, leading them to focus on the practical management of student behavior around science activities (Windschitl, Thompson, & Braaten, 2011). To overcome these challenges, teachers need resources that are linked to the content of assessment and can guide instruction.

Special educators, especially those who teach students with SCD, balance multiple curricular priorities including academics, functional domains, and other content prioritized through IEPs (e.g., therapeutic goals, transition goals). Designing assessments to provide feedback about student progress in science and also provide support for students' development in other valued areas can improve the assessment experience and support instruction in integrated curricula. For example, there is a natural connection between the UDL principles of multiple means of engagement and multiple means of action, and the common practice of teaching components of self-determination (e.g., choice-making, self-evaluation) to promote students' access to and progress in the general curriculum (Lee, Wehmeyer, Palmer, & Little, 2008).

Another important innovation is providing informative and on-demand score reports. Information about students' science achievement is often conveyed on summative score reports, with overall performance levels and perhaps subscale information. These reports generally do little to explain student progress toward science expectations by the end of high school, and even less to inform instructional remediation efforts or changes to improve within-year progress. In

addition to containing limited information to guide changes in instruction, past limitations of AA-AAS score reports include use of unfamiliar terminology, unclear scoring methods, and a focus on deficits (Nitsch, 2013). These findings underscore the clear need for actionable and informative score reports for students with SCD. The DLM Consortium has taken steps to address these concerns by conducting focus groups with teachers and parents to obtain feedback used to inform score report design, and by conducting usability studies with teachers to determine how they use information on score reports to guide instructional planning and decision making. Because the DLM assessment scoring is based on diagnostic classification models, score reports highlight skills the student mastered as well as potential next steps for instruction for each content standard.

I-SMART addresses these challenges and builds on recent research and development for the DLM Science Consortium by connecting local learning map neighborhoods, expanding the use of UDL principles in learning map and assessment development, developing and evaluating innovative items and assessments, and designing and evaluating a reporting dashboard to improve the usefulness of assessment results to inform ongoing science instruction and maximize student progress and achievement of high, NGSS-aligned expectations.

## **2. Potential contribution to theory, knowledge, and practice**

I-SMART will contribute to theory, knowledge and practice by producing a learning map model (Goal 1) that represents an integrated set of knowledge, skills and understandings that support attainment of the expectations in the NGSS. The learning map represents a unique contribution to the body of research that describes how students learn science content. The map also provides a structure upon which needed assessments can be built (Goal 2) that incorporate science disciplinary content and science and engineering practices in highly engaging,

universally designed, technology-delivered formats. A newly designed dashboard (Goal 3) meets the need for expanding knowledge of timely, informative, and instructionally relevant score reporting practices for teachers and students. Broad dissemination of project materials and findings (Goal 4) enhances the project's potential contributions.

I-SMART has several design elements with unique potential to advance knowledge and practice in science assessment systems. UDL principles will be applied across all project goals. Also, the project's focus on multiple populations reduces the distinction between students with SCD and other students, laying a foundation for a continuum of assessments that support progress for all students. With the discontinuation of AA-MAS and the recent change in the AA-AAS cap from 1% proficiency to 1% participation, some states are still in need of appropriate assessment options for students performing below grade level who do not qualify for AA-AAS. Learning map models, assessments based on those models, and informative score reports will provide a more seamless opportunity for students to grow toward grade-level expectations.

### **3. Generalizing from project findings**

Findings from the project are likely to be generalizable to students with disabilities, but potentially also to diverse populations of students without disabilities who are performing significantly below grade level in science. The five participating states ensure broad, demographically diverse sampling of teachers and students. Dissemination products will include explanations for technical and non-technical audiences to guide appropriate interpretations and explain cautions on the generalizability of the findings.

### **4. Promising new strategies that build on and are alternatives to existing strategies**

The I-SMART project builds on the foundation laid by DLM ELA, math, and science assessments; existing work in the body of science pedagogy and content knowledge to design

conceptual learning map models; innovative computer-based assessments; and technological reporting tools. The scope of this project covers many aspects of assessments for students with disabilities and draws from prior EAG research on learning map models (*Use of Learning Maps as an Organizing Structure for Formative Assessment*), AA-AAS, including alignment (*State Academic Learning Links with Self-Evaluation for Alternate Assessment*), technical adequacy and criteria (e.g., *Project DAATA: Developing Alternate Assessment Technical Adequacy*), and test construction (*Designing Alternate Assessments Based on Standards for Educational Test Construction, Evaluation, Documentation, and Fairness*). We also consider previous research on AA-MAS, such as struggling students with disabilities (e.g., *Identifying Students in Need of Modified Achievement Standards and Developing Valid Assessments*), cognitive complexity issues in reading (*Adapting Reading Test Items to Increase Validity of AA-MAS*), and technology-based assessments (e.g., *Reaching ‘Students in the Gap’ through Web-based Task Module Assessments*). The design of the project also allows us to examine the effectiveness of interleaving principles of UDL into a small-scale integrated assessment system focused on science. Drawing on years of research since 2009, by CAST and the Center for UDL, numerous UDL strategies will be used throughout the design and implementation processes (<http://www.udlcenter.org/research/researchevidence>).

## **5. Likely utility of project products**

I-SMART products include interdisciplinary learning map models in science, innovative assessments based on those learning map models and a reporting tool that will present actionable information for teachers about student understanding. Dissemination materials will describe the project’s lessons learned, best practices, and resources that can serve as models and resources for other states. The NGSS have increased science achievement expectations for all students,

including those with SCD. I-SMART creates a system in which a learning map, assessments, and reporting dashboard support teachers in helping students meet high expectations.

### **(C) QUALITY OF THE PROJECT DESIGN**

#### **1. Goals, objectives, and outcomes are clearly specified and measurable.**

I-SMART has goals to develop learning map models, innovative assessments, and reporting for instructionally embedded assessments in science, and to disseminate findings and products. The project targets two populations. The primary population is students with significant cognitive disabilities (SCD). The secondary population is students with disabilities who perform significantly below grade level in science but do not meet participation requirements to take alternate assessments. For the secondary population, I-SMART science content represents instructional targets on pathways toward meeting rigorous, grade-level NGSS expectations. UDL principles will be integrated into all project goals to promote accessibility and engagement for all students. I-SMART goals build on existing research and development conducted by the partner organizations through several projects including the Dynamic Learning Maps (DLM) Alternate Assessment Consortium, Enhanced Learning Maps (ELM) EAG, the National Alternate Assessment Center (NAAC), the Pennsylvania Modified Assessment Project: Pennsylvania Guide to UDL Test Item Modification, and UDL Framework & Guidelines for Computer-Based Testing.

#### ***Goal 1: Develop and evaluate a learning map model for science.***

I-SMART will build on existing local neighborhood maps around science grade-span targets for students with SCD (called Essential Elements) by integrating science map neighborhoods with a multidisciplinary learning map model that represents knowledge, skills, and understandings in ELA and math. These rich connections support multiple pathways toward

grade-level expectations and interdisciplinary instruction and assessment, particularly in science and engineering practices. Goal 1 involves developing and evaluating the learning map model.

The research question is: **What nodes and connections best describe the pathways of cognitive development that students follow as they progress from birth to 12<sup>th</sup> grade in the science core ideas and science or engineering practices?**

*1.1: Expand and connect the current science neighborhood map models.*

I-SMART builds on prior DLM work and expands on research design and methodology used by the DLM Consortium and the ELM project to develop learning map models for ELA and math. For the currently operational DLM Science Alternate Assessment, Essential Elements (EE) neighborhood maps provide a fine-grained description of how students develop mastery of an EE, with a total of 27 EE neighborhood maps that span nine science core ideas.

The current EE neighborhood maps will be expanded to model the connections between science, math, ELA, and foundational skills via common practices and crosscutting concepts. In Year 1, we will identify existing foundational, ELA, and math map content that is relevant to the science neighborhood maps. Next, we will identify and represent additional map content that needs to be developed. We will begin by mapping the additional knowledge and skills needed for science and engineering practices, those that are not already included in ELA or math. Literature reviews will be conducted, including reviews of the extant research on science learning progressions and the Project 2061 science literacy maps (AAAS).

Where needed, we will develop additional map content by creating nodes that meet specifications for complexity, size, usefulness, and UDL. Node specifications that address academic content and how students interact with that content with UDL considerations were established and have been refined in prior map development research (DLM and ELM map

models). *Appropriately complex nodes* are more complex than preceding nodes and less complex than subsequent nodes in the map. *Appropriately sized nodes* represent a single concept. *Useful nodes* describe skills that students must have to master an Essential Element. *Universally Designed for Learning nodes* specify the kinds of options required to ensure that competence can be demonstrated by students in the target populations, including students who have limitations in some or all of the three UDL principles: 1) affective and self-regulatory *engagement* limitations, 2) sensory-perceptual *receptive* limitations, and 3) strategic *expressive* limitations. The **Objective 1 outcome** will be an integrated and accessible science learning map model, in which science EE neighborhood maps are connected to the ELA, math, and foundational maps and other science EE neighborhood maps, as supported by the research on student learning and universal design.

### ***1.2: Conduct an expert review of the preliminary map model.***

Building on DLM and ELM map review methods, expert reviewers will use established processes to evaluate the quality of the new nodes and connections, ensuring that the new content meets criteria for inclusion in the map. Experts in science content and accessibility will evaluate nodes and connections. A panel of experts will be recruited from partner states. Reviewers will receive training and use procedures developed for prior EE neighborhood map review at an onsite panel meeting. Reviewer feedback will be used to make revisions to the map and ensure that the representations included in the map are of high quality. The **Objective 2 outcome** will be a refined map model that includes nodes, connections and multiple pathways that meet standards for content and accessibility and is ready to serve as the basis for assessments.

***Goal 2: Design, develop, and evaluate assessments that incorporate science disciplinary content and science and engineering practices in highly engaging, universally designed, technology-delivered formats.***

Goal 2 builds on Goal 1. Three research questions will guide the iterative design, development, and evaluation of innovative science assessments using an evidence-centered design approach based on the learning map model. The research questions are: **(1) How do students interact with the features of innovative item types and with innovative testlets? (2) How do different item features (e.g., interactive engagement activities, relevant science practices) impact item performance? (3) What are teachers' perceptions of their students' experiences with the new testlets?**

***2.1: Revise conceptualization of testlet design.***

I-SMART builds on prior assessments designed and developed for the DLM Consortium in ELA, math, and science. The DLM assessments are a series of testlets, each of which contains an engagement activity and 3-9 items. Items in testlets align to nodes (learning targets) from the learning map model. Within the current DLM alternate assessments, UDL has already played a significant role. Testlets are scenario-based, contain text and images, and provide accessibility features such as text-to-speech. However, much remains to be done to fully implement the UDL framework in the system.

Objective 1 expands on previous testlet design by reconceptualizing the purpose and structure of testlets to be of high interest and engaging, supporting student decision making and self-regulation, as well as graduated supports, particularly in light of the skills that are required for science and engineering practices and different contexts that can be used to explore science core ideas. The Objective 1 activities include a literature review and the development of a

theoretical framework for testlet design. These activities address typical assessment design issues (e.g., item types and sequencing within a testlet), but also address the application of UDL to assessment (Dolan et al., 2006; 2013), particularly content that enhances engagement through choice making, self-regulation, and self-evaluation.

Literature review findings and the proposed testlet framework will be shared with the Project Governance Board (see Management Plan) for feedback. Likely improvements to testlet design include increasing the motivational aspects of testlets to contain grade-appropriate content and providing ways of interacting with testlets by having students make choices and collect or organize data or predictions. In addition, UDL specifications across testlets will be established to facilitate better consistency of engagement, choice, and tool use. Such engagement activities should establish a context in which a student can use science or engineering practices to demonstrate understanding of a science concept in multiple ways. Other proposed improvements may include changes to the testlet structure, such as logical routing that guides students through a series of steps in an experiment, and tasks that measure a wider range of content at different levels of complexity within the same testlet. The **Objective 1 outcome** will be an updated framework for testlet design that includes descriptions of types of UDL engagement, choice, tool use, and items that support student progress toward proficiency and science learning as well as their proficiency as learners.

## ***2.2: Revise Essential Element Concept Maps***

The DLM consortium uses a multi-step process to create assessments that begins with a set of materials that support the development of testlets. An Essential Element Concept Map (EECM; DLM, 2016) is a guide for test developers that contains the specifications for assessment items and testlets in a format that integrates the structure of the learning map model.

Use of EECMs is based on evidence-centered design (ECD; Mislevy et al., 2003), UDL (CAST, Inc., 2012), and prior DLM test development research. The EECM format incorporates critical elements of ECD, including the development of design patterns that list assessment attributes, as well as templates, specifications, and descriptions of performance tasks. Current DLM science EECMs have three linkage levels that represent steps toward mastery of the EE. Testlets are designed for individual linkage levels. EECMs include relevant vocabulary and/or concepts, questions to ask, and misconceptions. I-SMART will explore the applicability of an ECD-based design methodology that leverages UDL to improve the validity of inferences about the performance of students with disabilities on large-scale science assessments (Haertel et al., 2010; Mislevy et al., 2013) by working to expand EECMs to incorporate the multi-dimensionality of the NGSS, and the design decisions produced as part of Objective 1. I-SMART will build on the EECM format used by the DLM system to represent information from the science learning map model and will include intentional design elements for the purpose of building certain self-determination skills including choice-making and self-regulation. EECMs will focus on three disciplinary core ideas from the NGSS: Physical Science 1, Life Science 2 and Earth and Space Science 3. The **Objective 2 outcome** will be 11 EECMs for selected science EEs that incorporate multiple representations found in the learning map models, reduce barriers, and maximize engagement.

### ***2.3: Develop and evaluate innovative testlet prototypes***

Objective 3 includes innovative item types and innovative testlets. Testlets will measure developing proficiencies in two NGSS dimensions: science core ideas and science practices (although DLM science is aligned with EEs that integrate the two dimensions, the observations do not facilitate reporting of progress in each dimension). New ways to observe student

performance will be developed to locate students on pathways of proficiency development in the NGSS science core idea and the science and engineering practice dimensions. Using outcomes for objectives 1-2, testlets will be designed that incorporate UDL to address engagement, representation, and action/expression so as to maximize student engagement and access and to minimize barriers. Items will be embedded throughout the testlet to engage students in the simulated experiment or activity through the gathering and organizing of data based on what they observe, the analysis of this data, and then interpreting the results to demonstrate understanding of the science concept. Prototype testlets will have sufficient numbers of items supporting each NGSS dimension to allow reporting of student progress in each dimension. Prototypes will represent three different linkage levels and grade bands.

Prototypes of innovative item types will be tested through item tryouts similar to procedures used with students with SCD in past studies. Prototypes of entire testlets will then be tested using cognitive lab techniques that have been used in prior DLM research (Karvonen, Swinburne Romine, & Clark, 2016). Participants in cognitive labs will include 6-8 students from both the primary population and the secondary population. Protocols will be explicitly enhanced to capture measures of interest, motivation, and affect as well as the perception of and use of choice, alternative representations, graduated complexity, and tools. The primary purpose of the labs is to gather evidence of response process to evaluate whether students interact as intended with the testlet or whether the item format and response demands introduce construct-irrelevant variance (Karvonen et al., 2016). The **Objective 3 outcome** will be a set of 3 innovative testlet prototypes.

**2.4: Develop a set of innovative testlets.**

Using lessons learned from prototype evaluation, testlets will be developed for the selected set of each disciplinary core idea across each grade span. The test development process is designed to produce high quality, accessible measures of the identified constructs. Testlets go through a series of reviews for science content, accessibility, bias and sensitivity, instructional relevance, and editorial style. Item writers and external reviewers will be recruited from partner states. The **Objective 4 outcome** will be a set of 24 testlets ready for pilot testing. We will produce testlets that use the underlying structure of the learning map model to support flexible assessment at three different overlapping ranges of complexity. Six testlets will be produced at the lowest and highest ranges, with twelve testlets at the middle range. Testlets will be based on a subset of the EECMs developed in objective 2, with at least two disciplinary core ideas represented in elementary, middle and high school.

**2.5: Pilot test and evaluate the new set of testlets.**

Partner states will recruit students and teachers to participate in the pilot study. The pilot test will serve a variety of purposes as follows: (1) evaluate new testlets; (2) inform selection of scoring model; and (3) evaluate teachers' perceptions of students' experiences with the assessment. The pilot test design will ensure that students are assessed on items that match their current level of knowledge and skill levels that are slightly higher and lower than their current skill set. This design informs map-based probabilities of student mastery of nodes. Students will be assigned to one of the complexity ranges and administered testlets within each of available disciplinary core idea domains. A matrix sampling design will be used to ensure adequate sample sizes are obtained for each testlet. We are estimating 1,500 students per grade span (N = 4,500 total) distributed across the complexity range assignments with each student receiving two to

three testlets. For exploratory purposes, a small group of low-achieving students without disabilities (N = 250) will also be included in the pilot. After testlet administration, a survey will be administered to collect data on teachers' perceptions of students' experiences with the assessment including student engagement, ease of use, device familiarity, and testlet difficulty.

Information on how students advance through the testlets (e.g., student choice on next best step in a science experiment), will inform typical and atypical response process patterns, including their use of opportunities for feedback, embedded supports, and choices. Describing the patterns allows us to check common misconceptions specific to skills and practices and evaluate the student experience of the testlet. Pilot data will be used to describe typical and atypical pathways through testlets.

Data from the pilot test will be used to evaluate item quality. Student response data will be used to evaluate item difficulty. Coded item features (e.g., interactive engagement activities, relevant science practices) will be used to evaluate how each feature impacts item performance. Depending on whether innovative item types allow for partial credit scoring, the pilot data will also inform the selection of the final scoring model (e.g., dichotomous or polytomous DCM). Potential models will be fitted to the data and evaluated for model convergence and fit to determine final model selection

**Evaluating validity, reliability, and fairness.** Early in the project, staff will develop a draft validity argument for Project Governance Board review. This argument will include propositions and assumptions that would be evaluated through a series of studies, some of which would be conducted during I-SMART and others of which could be conducted in the future. Reliability and fairness are considered issues for evaluation that are under the broader umbrella of validity.

I-SMART validity evidence will include documentation of content-related evidence, such as the map external review, framework for testlet design, Essential Element Concept Maps, and item writer training documentation (Goals 1-2). Evidence based on response process includes observations and cognitive labs conducted with students as they complete the innovative items and testlets (Obj 2.3). While these sources will provide evidence for a small number of students and there will be limits on inferences that can be made about the larger population, teacher surveys during the pilot (Obj 2.5) will also be used to gain a larger sample of feedback on educators' perceptions of students' ability to respond to the items as intended and their perception of testlet difficulty. Evidence based on internal structure will include evidence of potential item bias, where sample size allows. Differential item functioning (DIF) will be implemented to compare demographic subgroups of the population to ensure construct irrelevant variance is minimized. Preliminary evidence of potential consequences of testing will include usability studies of the score report dashboard conducted on-site with educators (Obj 3.4). Reliability evidence will be calculated in a manner that is consistent with the learning map structure and the scoring model (Rupp, Templin, & Henson, 2010; Templin and Bradshaw, 2013) and that has been applied in the past (DLM, 2016). Fairness will be evaluated through documentation of the use of UDL principles in Goals 1-2 and with analyses of pilot survey responses on students' familiarity with the testing devices and ease of use of item features; and with differential item functioning (DIF) analyses by student subgroups. While DIF does not always indicate a weakness in the test item, it can help point to construct-irrelevant variance, thereby contributing to an overall argument for validity and fairness. Research suggests that students' degree of familiarity with a computing device may impact performance and may further interact with the type of item assessed (DePascale, Dadey & Lyons, 2016).

The **objective 5 outcomes** include a framework for evaluating innovative items and testlets; documentation of findings from the pilot study; and testlets that are ready for operational administration and scoring to determine student mastery of learning map nodes in the EE neighborhoods assessed.

***Goal 3: Design, develop, and evaluate a dashboard that describes student performance on science assessments.***

Goal 3 involves the development of a reporting dashboard that provides teachers with feedback about student performance and progress in science. The dashboard will include recommendations for instruction and embed just-in-time assessment literacy supports to facilitate appropriate interpretations and uses of assessment results. The structure and function of the dashboard will be, in part, by the learning map model (Goal 1) and innovative science testlets (Goal 2).

The dashboard is intended for primary use by teachers, but also will be designed to support teachers' communication with students and their parents/guardians. The dashboard will be display small views of map sections that are associated with skills from specific core ideas and science and engineering practices. Visualizations will include views of the nodes and connections from the learning map models as indicators of the student mastery of map nodes. The dashboard design will be informed by the UDL framework to support understanding and use of information by a wide range of users. Indicators of student performance are to be based on automated scoring of the testlet items, allowing the dashboard to provide immediate feedback on student performance. Automated scoring of pilot testlets will include testlet level performance metrics such as student probability of mastery of nodes assessed within the testlet, amount of time student was engaged per testlet, and student responses to items used to maximize

engagement (e.g. choice, tool use). The research questions are **(1) What features and information do stakeholders find useful in a science assessment dashboard? And (2) How do teachers interpret and use science assessment dashboard information to inform instruction?**

***3.1: Gather stakeholder input from teachers about useful information to be displayed in a reporting dashboard.***

In years 1 and 2 we will identify the types and uses of information to be included in the reporting dashboard. Stakeholders will be from partner states and include teachers of science content and students in the target populations, as well as parents/guardians and district staff with relevant experience. Through a series of three focus groups with five participants each, input will be gathered on (1) features related to reporting of student performance, (2) features related to recommendations for instruction, (3) formats for presentation of performance information and instructional recommendations, and (4) needs for embedded assessment literacy supports to ensure teachers can appropriately interpret the report contents. We will present panelists with visual elements from existing score reports to elicit feedback about gaps between current practice and desirable elements for the prototypes described in Objective 2. The **Objective 1 outcome** will be a set of recommendations to guide development of dashboard prototypes.

***3.2: Using an iterative design process, develop prototypes and collect feedback.***

In order to be useful for planning instruction, a reporting dashboard should present information that meets the user's information needs for goal-setting, monitoring progress, addressing individual needs, and allow for the opportunity to evaluate practice (Marsh, Pane, & Hamilton, 2006). In year 3, using information gathered from objective 3.1 and UDL principles to maximize accessibility, usability, and engagement we will develop prototypes of an assessment

and learning dashboard. This dashboard will guide interpretation of assessment data to support understanding of student learning progress by teachers, students, and parents and support instructional decision making by teachers. The use of a learning map model as a basis of the dashboard will allow teachers to make decisions to support instruction based on a wider view of the science content, including specific knowledge about learning milestones in science content and science and engineering practices.

Using iterative prototypes we will develop a dashboard using Verbert et al. (2013, pp. 1501-1502)'s four stages of intended use: awareness, reflection, sensemaking, and impact. The "Awareness" stage includes presenting relevant data about student performance in the context of the nodes and connections in a small section of the learning map model. Using the dashboard display, teachers will be able to engage in the second stage, "Reflection," interpreting data to ask questions about the underlying KSUs represented in the map in relation to the student's current performance. "Sensemaking," involves answering the questions generated from the previous stage by combining the information in the dashboard and the teachers' prior knowledge of individual students. The fourth stage, "Impact," describes when teachers are able to use the answered questions to adjust instruction.

Application of UDL principles during prototype design will support flexible use and application of the dashboard. Teachers will have the option to view data indicators of student performance in a graphic or tabular display depending on the context in which they're sharing data with students or parents/guardians. Using the above described stages of development, we will apply the UDL framework to incorporate and evaluate supports and scaffolds for teachers and students in support of interpreting and acting on the dashboard information. Prompts or guiding questions may be provided to assist users in reviewing the dashboard data to support

awareness of what data is available and how to consider that data. Samples of reflective questions appropriate to the type of data displayed in the dashboard will be available as an option for users. Similarly, both sense making and impact of the intended use process may be supported with models, guiding questions, and examples of methods for adjusting instruction, strategies or teaching techniques to better meet the needs of individuals. Additionally, data reports can optionally be annotated with testlet descriptions and links to content standards. We will use an agile co-design process with 15 stakeholders (teachers, parents/guardians and students) to permit rapid generation, evaluation, and reworking of ideas, using a combination of initial face-to-face sessions and follow-up remote session. Feedback on successive prototypes will be sought from the Project Governance Board and local educators in partner states via online meetings. The **Objective 2 outcome** will be a final dashboard prototype with design elements with recommendations for training of teachers on effective use of the reports and data displayed. Software code will be developed to support the intended features.

***3.3: Develop a system for online delivery of reports via the dashboard based on automated scoring of student assessments.***

This objective involves software development to integrate the information, design features, and functionality from Objective 3.2 with the data needed to make the reports functional. Reports will be based on the automatic scoring of student responses to the testlets created and will undergo quality assurance procedures as part of Goal 2. Objective 3 activities will include software development and quality assurance testing to deliver a system that integrates automated scoring with the dashboard design. The **Objective 3 outcome** will be a system that is ready for evaluation.

***3.4: Evaluate interpretability of score report contents and usability of the dashboard.***

Evidence from interpretability and usability studies will be evaluated to determine whether the dashboard structure and reporting interface supported the intended uses. A dashboard usability study will evaluate teacher interaction with the elements of the dashboard, including their understanding of the functions and navigation process, their uses of the available flexibilities, and the extent to which the overall dashboard design and contents met their needs. Interpretability will be evaluated using cognitive interviewing techniques similar to those used in previous score report interpretation research (e.g., Karvonen, Clark & Kingston, 2016). Usability and interpretability will be evaluated through on-site interviews with up to 16 teachers recruited from partner states. The **Objective 4 outcome** will be a summary of interview findings and recommendations for dashboard refinements.

***Goal 4: Broadly disseminate project materials and findings to a variety of audiences.***

Goal 4 activities consist of (1) developing of a coherent and comprehensive dissemination plan, and (2) implementing the plan. The I-SMART dissemination component includes distribution of materials and products throughout Goals 1-3 as well as reports on lessons learned during the design process and research outcomes. There are multiple audiences for the anticipated dissemination products, including stakeholder organizations, educators in the field, professional organizations, researchers, and policy makers. Dissemination efforts will focus on (1) increasing awareness of the availability of the learning map model, assessment, and reporting system for testing and further adaption once the project is complete; (2) sharing project findings, lessons learned, and promising practices from the design and development process; and (3) promoting replication and scale-up of the system with additional populations of students and application of the design and development process to additional science content. UDL principles

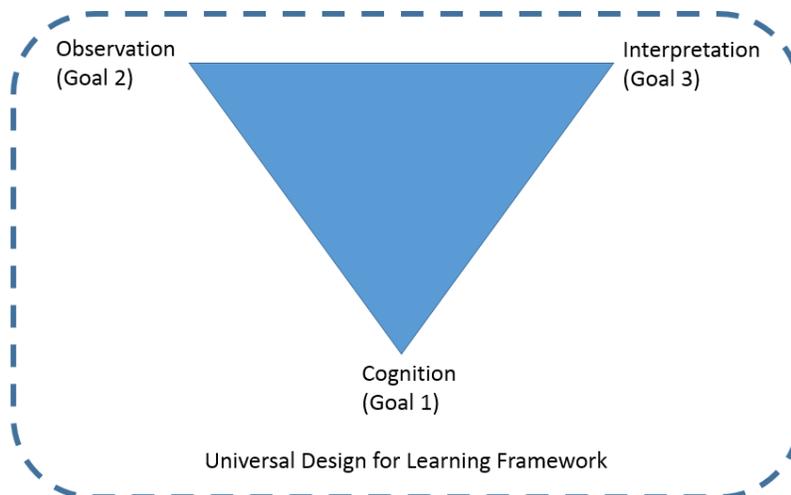
will be applied to help ensure dissemination elements are appropriate for the audience and usage contexts.

As part of the project's iterative research design, stakeholder participation will be integral throughout years 2-4. Project staff will rely on feedback to inform updates and improvements to published materials. Stakeholder involvement will support dissemination in communities of practice within and beyond participating states. Stakeholder feedback will also inform the design of dissemination products and the use of traditional and social media to communicate about the products. The potential for learning map models, assessments, and reporting to have an enduring effect on instructional practices will be enhanced by the intended broad availability of the products developed during this project.

The broadest and most immediate reach to districts will likely be through the Project Governance Board. Materials and findings will also be disseminated through peer-reviewed presentations at relevant national researcher and practitioner conferences for professional organizations such as the Council of Chief State School Officers, the Council for Exceptional Children, National Council on Measurement in Education, and the National Association for Research in Science Teaching. The National Center on Educational Outcomes (NCEO) has agreed to disseminate I-SMART findings through its channels (see part 6 for letter of commitment). Project staff have considerable expertise in dissemination to stakeholders including SEA and LEA staff, researchers, policymakers, and non-technical audiences such as teachers and families. **The Goal 4 outcome** will be a collection of products that describe the project's lessons learned and best practices that can serve as models and resources for other states.

**2. Conceptual framework underlying the proposed project**

The I-SMART conceptual framework layers the UDL Framework (Meyer, Rose, & Gordon, 2014) on the assessment triangle (National Research Council, 2001). The assessment triangle includes three key elements: a model of cognition, observations of students, and the interpretations of observations. The dimensions are interconnected and interdependent (Pellegrino, 2012), I-SMART goals target each vertex. In Goal 1, we will develop a science learning map model that is a complex representation of how students demonstrate and develop mastery in science. This model provides an evidence-based structure upon which assessments may be built. In Goal 2, using the science learning map model as an element in an evidence-centered design process, we will develop new assessments that focus on the most important knowledge, skills and understandings (KSUs). These assessments will be fair and reliable and will support valid inferences. In Goal 3 we will develop a score reporting dashboard to deliver integrated information from student observations (assessments) based on parts of the map (cognition) in order to support appropriate interpretations about student learning.



To support assertions that knowledge and skills demonstrated on an assessment reflect students’ abilities, tasks must “elicit cognitive processes associated with the underlying cognitive

model so that observed item responses can lead to valid inferences about the construct under investigation” (Ketterlin-Geller, 2008, p. 10). UDL principles will overlay all project goals to ensure that the target populations have opportunities to access meaningful, instructionally relevant science assessments. The learning map model (Goal 1) will be developed using UDL to ensure that nodes are accessible by all students and connections describe alternate pathways students may take. The assessments (Goal 2) will be developed using UDL to create opportunities for students to be more engaged, have more choice, better understand content through flexible means of representation, and communicate their complex KSUs using flexible means of expression. The dashboard (Goal 3) will be developed using UDL to provide variable views on student activities, pathways through the map, and performance to create a finer grain-sized reporting levels that support instructional decision-making.

**3. Activities constitute a coherent, sustained program of research and development in the field, including a substantial addition to an ongoing line of inquiry.**

I-SMART builds on existing lines of inquiry in map development, assessment design, and reporting of results. The application of UDL principles in all three broad areas of development (learning map models, assessments, and reporting) is a combination and extension of existing work by CETE and CAST. This project will significantly extend that work through its linkage to the DLM framework and new innovative testlets with new presentation, choice, and response options. I-SMART extends recent research on assessment design, the use of innovative item types in AA-AAS, scoring models, score report design and use, and methods for evaluating reliability, validity and fairness.

**4. The project is based upon a specific research design, and the quality and appropriateness of that design, including the scientific rigor of the studies involved.**

All I-SMART research activities fall in the category of validity studies (Marion & Perie, 2009). Designs for each study vary and include quantitative and qualitative methods. Each study is designed based on established methods with sufficient rigor to be used for USED peer review of assessment systems and for acceptance in peer-reviewed journals. Each study will be designed with input from the Project Governance Board to answer specific research questions. The size and diversity of partner states ensure large sample sizes and access to multiple populations.

**5. Development efforts include adequate quality controls and repeated testing of products.**

Project design features such as prototyping and stakeholder and expert review provide opportunities to repeatedly test products and improve upon them before they are finalized. Quality control methods will be applied, including quality assurance in software development, quality control of testlets prior to online delivery, and careful editorial review of final products.

**6. The project design reflects up-to-date knowledge from research and effective practice.**

I-SMART meets the challenges of new science content standards by building learning map models based on current research and designing testlets to be engaging, support student decision making and self-regulation, and extending these design methods to a dashboard to report assessment results. I-SMART reflects an up to date approach to computer based assessment system design, using ECD (Mislevy, Steinberg, & Almond, 2003) and UDL (CAST, 2011) to support development of interactive, reliable, valid, and fair tools for assessment of complex reasoning skills (DeBoer et al., 2014) and understandings in science. I-SMART will explore the applicability of an ECD-based design methodology that leverages UDL to support timely, valid inferences about student performance on large-scale science assessments (Haertel et al., 2010;

Mislevy et al., 2013). The project will use the UDL Framework, which has been featured in the National Education Technology Plan (OET, 2016), the Educational Technology Developer's Guide (OET, 2015) and especially in the recent Every Student Succeeds Act (ESSA, 2015). Principles of the UDL Framework will overlay all goals of the project to ensure that the target populations have opportunities to access meaningful, instructionally relevant assessments of science content. Principles of the UDL Framework will overlay all goals of the project to ensure that the target populations have opportunities to access meaningful, instructionally relevant assessments of science content.

#### **7. The quality of the methodology to be employed in the proposed project.**

The learning map development, use of ECD and UDL in innovative assessment design, and development of a reporting dashboard are based on work done by the DLM Consortium for operational assessments in ELA, math, and science. I-SMART activities draw on proven methods for map and item development, expert review procedures, and research design and implementation. All activities will be designed to provide evidence consistent with the *Standards for Educational and Psychological Testing* (AERA et al., 2014). The Project Governance Board will advise on appropriate refinements to each method prior to implementation.

#### **8. The potential and planning for the incorporation of project purposes, activities, or benefits by the applicant beyond the grant.**

I-SMART supports MSDE's existing and future efforts in continuous improvement of instruction and assessment in science for students with SCD and students performing significantly below grade level. MSDE is confident that the products of this assessment will support Maryland's transition to next generation science assessments for all students. This project also aligns with CETE's current work to design and deliver next-generation science

assessments used for accountability for the DLM Science Consortium. While the testlets developed in Goal 2 will be appropriate for instructionally embedded assessment, lessons learned will be applicable to the development of assessments used for summative purposes. Several outcomes will support future innovations. For example, the pilot data (Obj 3.5) could be used to empirically validate the learning map model (Obj 1.2). The UDL innovations in testlet design and dissemination will be readily applied to other assessment challenges for the general population as well as other systems such as online learning. I-SMART products will be made available at the conclusion of the grant and may be used as models by other states or agencies to develop similar tools for integrated assessment systems in science or other content areas. See (i) Strategy to Scale for details.

#### **(D) QUALITY OF PROJECT SERVICES**

Students with disabilities are still struggling to make progress in science. For example, results from the grade 5 Maryland School Assessment in Science (MSDE, 2016) show that 22.5% of students in special education are performing at proficient or advanced levels, compared to 64.8% of general education students. Students with SCD taking science AA-AAS are also struggling. A 2016 summative assessment based on the rigorous DLM Essential Elements for Science involved 21,533 students with SCD. Fewer than one-fourth of the students across grades 4-8 and high school were performing at target or advanced levels. (Karvonen, Nash, & Clark, 2016).

I-SMART state partners bring a diverse range of stakeholders and students from the target populations. This allows the project to consider and support all students with disabilities who are working on content included in the map. For the first time, a seamless assessment model can be built that recognizes students with disabilities as a heterogeneous group who perform along a

continuum of learning rather than belonging to discrete categories. This design is highly appropriate for a model based on learning map structures and will support higher attainment for students who are at risk of lesser opportunities due to the impact of recent policy changes (e.g., removal of AA-MAS and changes to the 1% cap).

Instructionally embedded science assessments will lead to improvements in student achievement because of the relationship between content, assessment, and instruction. Such a coherent system will tie closely to the taught curriculum and units of study, selected specifically by the teacher for the classroom context. The immediate, targeted information and feedback available via the dashboard will support instructional adjustments. This model has provided useful tools for teachers and increased student achievement (Chung Wei & Cor, 2015).

Instructionally embedded assessments are currently available in the DLM ELA and math assessments, and educators have reported that having a learning map model to indicate next steps for instruction and embedded assessments to check student progress have been helpful. With the I-SMART innovations, educators will be able to increase their understanding of rigorous science content and pathways to learning for students who are challenging to teach and assess.

## **(E) QUALITY OF PROJECT PERSONNEL**

### **1. Qualifications of project director and principal investigator**

**Marsie Torchon, BS, Project Director (.2 FTE Y1-4)**, will chair the Project Governance Board and oversee the project on behalf of the Maryland State Department of Education (MSDE). Ms. Torchon is the Program Specialist for Alternate Assessments at MSDE. Ms. Torchon received her BS in Psychology with a minor in Special Education from James Madison University. As Program Specialist, Ms. Torchon oversees implementation of Maryland Alternate Assessments and monitors and facilitates the administration of accommodations and accessibility

features for all assessments. Prior to joining MSDE, Ms. Torchon was a Scoring Specialist with Pearson for nine years, where she was involved in the planning, developing, and scoring programs for PARCC, The National Board, as well as Maryland, Virginia and Washington's alternate assessments for students with SCD.

**Meagan Karvonen, PhD, Principal Investigator (.15 FTE Y1-4)**, will oversee the governance, research, design, implementation, and dissemination activities. She will serve as the primary contact to MSDE for project implementation and oversight; ensure that all project activities are proceeding as planned; and oversee expenditures for the KU portion of the budget. Dr. Karvonen is an Associate Director of the Center for Educational Testing and Evaluation (CETE) and the Director of the DLM Alternate Assessment Consortium. As DLM Project Director, she collaborates with 18 consortium partner states including 8 science states to deliver operational assessments, oversees ongoing research on the assessment system, and provides technical assistance. Dr. Karvonen has 15 years of experience in large-scale assessments for students with disabilities, and in particular AA-AAS for students with SCD. Specific projects include developing methodologies for investigating opportunity to learn, fairness, and alignment within AA-AAS systems; designing and conducting validity and reliability studies; and conducting research on the impact of assessments on teaching and learning. She has co-authored 40 articles and book chapters, more than 50 technical reports, and nearly 100 presentations. Dr. Karvonen has nearly 20 years of experience managing state- and federally-funded projects and has served as PI or co-PI on projects totaling \$29.7 million. She served as the PI on a previous Enhanced Assessment Grant awarded to the Arizona Department of Education (Longitudinal Examination of Alternate Assessment Progressions, S368A100006).

## 2. Qualifications of key project personnel

Key personnel include staff from the University of Kansas and CAST.

**Jose Blackorby, PhD, Co-PI (.2 FTE Y1-4)**, will serve on the leadership and research teams and co-lead the assessment design team. Dr. Blackorby is the Senior Director of Research and Development at CAST. Dr. Blackorby has over 20 years of expertise in the design and implementation of large-scale, multifaceted studies with research, policy, and practical implications for students with disabilities. Dr. Blackorby led a team to design the first national assessment inclusive of 10,000 students in all 13 federal disability categories as part of the Special Education Elementary Longitudinal Study, which included a standard assessment and an alternate assessment for students with SCD. Dr. Blackorby was also PI of the IES-funded National Study of Alternate Assessments, which documented alternate assessment practices across the country. He also was UDL Task Leader for the Evidence Centered Design for the National Center and State Collaboratives consortium. Dr. Blackorby has considerable experience in projects related to emerging trends in education reform and innovation, and their potential for students with disabilities. A widely published author, Dr. Blackorby serves in an advisory role on national panels for government initiatives and private organizations. He contributed peer-reviewed publications and reports that have had policy significance in the areas of special education, academic achievement, STEM, UDL, and alternate assessment.

**Russell Swinburne Romine, PhD, Co-PI (.2 FTE Y1-4)**, will be on the leadership and research teams and will co-lead the assessment design team. Dr. Swinburne Romine holds a doctorate in Educational Psychology from the University of Minnesota and is the Associate Director for Test Development and Production for the DLM Alternate Assessment Consortium. He currently oversees more than 25 staff members responsible for the design and delivery of

DLM assessments. His research has focused on the application of psycholinguistic findings to learning map model design as well as accessibility and validity research in support of the DLM assessment system. Dr. Swinburne Romine has significant experience in using principles of evidence-centered design and UDL to create assessments for students with disabilities. He has presented research nationally and contributed to technical reports for the DLM consortium. He also currently serves as an advisor to another EAG, the *Use of Learning Maps as an Organizing Structure for Formative Assessment*, awarded in 2015, where he provides expertise in the development and revision of learning map models and the development of formative assessment materials for English language arts in grades 2-8.

**Research Project Manager (TBH, 1.0 FTE Y1-4)**, will be responsible for coordinating activities between teams and external partners and for monitoring project management and deliverables. The RPM will support study recruitment, collaboration among teams, technical documentation, manage timelines and deliverables and contribute to the research effort in all four years. The RPM will assist the PI and co-PIs with communications, meeting and event planning, travel arrangements, and conference calls. The RPM will have a master's degree (PhD preferred) in education or a related field and have prior experience with research design and research project management. When hiring we will adhere to the University of Kansas (KU) policy that encourages applications from underrepresented group members and prohibits discrimination on the basis of race, color, ethnicity, religion, sex, national origin, age, ancestry, disability, status as a veteran, sexual orientation, marital status, parental status, gender identity, gender expression and genetic information.

**Sue Bechard, PhD (.10 FTE Y1-2, .05 FTE Y3-4)**, will serve on the leadership and research teams as senior advisor. Dr. Bechard has served in a similar role for the DLM Consortium since

2011. She has focused her career on promoting inclusive educational assessment and instructional practices through design and implementation of comprehensive alternate assessment systems in more than 18 states. This has included providing face-to-face and online professional development opportunities to teachers of students with SCD. She has served as principal investigator or leadership team member on numerous federally funded grants. Her research focuses on the development, validation, alignment, and consequences of assessments for students with disabilities.

**Lori Andersen, PhD (.2 FTE Y1, .05 FTE Y2-4)**, will serve on the research team, and will have principal responsibility for the development of the science learning map model for Goal 1. Dr. Andersen holds a doctorate in Educational Policy, Planning, and Leadership from William and Mary and is the Science Research Lead for the DLM Consortium. In that role she conducts research for the consortium that focuses on the application of science education research to develop the DLM science learning map model and the use of evidence-centered design and universal design to create assessments for students with SCD. Before joining CETE, Dr. Andersen taught courses in science education and research methods at Kansas State University. She has co-authored 12 articles, 5 book chapters, 17 conference presentations, and has led numerous teacher professional development presentations. Dr. Andersen is a national board certified teacher who taught science in K-12 schools for 17 years.

**Lindsay Ruhter, MA (.15 FTE Y1, .2 FTE Y2, .05 FTE Y3)**, will serve on the assessment design team and lead the development of innovative test items, as well as support learning map development. Ms. Ruhter earned a master's degree in special education at the College of William and Mary and is currently the Test Development Coordinator for the DLM Consortium. In this role, she is responsible for the development and coordination of DLM science assessments. She

uses her special education background to review and edit test items to increase accessibility to science content to students with SCD, as well as develop and conduct training for item writers, internal reviewers and external reviewers. Before coming to CETE, Ms. Ruhter was a special education teacher in Virginia where she taught students with SCD and students with mild to moderate disabilities.

**Brooke Nash, PhD (.05 FTE Y1, .15 FTE Y2-4)**, will serve on the research team and will lead the psychometric team with principal responsibility for psychometrics, data management and analysis. Dr. Nash earned her doctorate and master's degrees in educational psychology from KU, specializing in research, evaluation, measurement, and statistics with a minor in special education. She joined CETE in 2014 as a senior psychometrician. Previously, she worked as a psychometrician at Ascend Learning, specializing in assessments in higher education. Her research interests include formative assessment, scoring models for technology-enabled assessments and implementation of diagnostic assessment platforms.

**Amy Clark, PhD (.05 FTE Y1&Y3, .10 FTE Y2)**, will serve on the project's psychometric team and support data management and analysis. Dr. Clark began her career as a classroom teacher and now holds a MS and PhD in educational psychology from KU, specializing in research, evaluation, measurement, and statistics, with a minor in curriculum studies. She currently serves as a psychometrician for the DLM Alternate Assessment Consortium. Her research interests include exploring potential threats to validity, the development of actionable score reports, and the implementation of diagnostic assessment platforms.

**Michelle Shipman, BA (.10 FTE Y1-2)**, will serve on the assessment design team and supervise the development of EECMs and preparations for item writing and external review. Ms. Shipman has served as the ELA test development coordinator for the DLM Consortium since

2012 and is also the test development lead for all CETE-delivered AA-AAS. Ms. Shipman's research involves text development for reading assessments and the design of writing assessments for students with SCD to further their literacy skills. Before joining CETE Ms. Shipman's 20-year teaching career included teaching science and language arts classes. She earned a BA in education from Washburn University with emphases in English and science.

**Susan Martin, BS (.03 FTE Y2-4)**, will lead the technology team responsible for programming enhancements to the online assessment system for Goal 2 and the dashboard for Goal 3. Martin is the Director of Agile Technology Solutions at KU. Ms. Martin is a key partner with CETE, coordinating with stakeholders and overseeing program execution. She brings nearly 20 years of experience in software development and integration. Before joining ATS, she worked at Hewlett Packard Enterprise, where she led a delivery team of 65 technical professionals supporting HR, payroll and financial applications. Using agile development methodology, she coordinated with key stakeholders to identify strategic business goals and vision, and worked closely with those clients to define and prioritize business and system requirements. Her work included leading project management, business analysis, development, database administration, and quality assurance teams. Martin received the American Airlines Customer Award for Service Excellence for the work she and her team performed for them.

**David H. Rose, EdD (.05 FTE Y1-4)**, will serve on the assessment design team and contribute to the development of testlets that meet the standards of UDL. Rose is a developmental neuropsychologist and educator whose primary focus is on the development of new technologies for learning. In 1984, Rose co-founded CAST, a not-for-profit research and development organization whose mission is to improve education for all learners through innovative uses of modern multimedia technology and contemporary research in the cognitive

neurosciences. That work has grown into the field called Universal Design for Learning which now influences educational policy and practice throughout the United States and internationally. Rose is the coauthor of five scholarly books, numerous award-winning educational technologies, and dozens of chapters and research journal articles. He has been the principal investigator on large grants from the National Science Foundation, the U.S. Department of Education (US DOE), and many national foundations. In the policy arena, he has testified before the U.S. Senate, contributed to the US DOE's National Education Technology Plans (2010, 2016) and the Ed Tech Developer's Guide (2015), and helped to lead the development of the National Instructional Materials Accessibility Standard (NIMAS).

**Tracey Hall, PhD (.2 FTE Y1-4)**, will serve on the assessment design team and will contribute to the development of testlets that meet the standards of UDL. Dr. Hall's research focuses on assessment for students with disabilities, particularly formative assessment techniques and developing universally designed technology-based interventions in reading, writing, and science. She has worked on both large scale summative assessments and formative assessment bringing a UDL perspective to assessment design. She worked with the National Collaborative Center on Standards and Assessment Development (NAAC) and the Center on Progress Monitoring led by AIR. Dr. Hall has been a PI or co-PI on several grants, including an IES-funded development project, *Creating Compositions using a Technology-Based Writing Tool: Supporting Students with Universal Design for Learning*, (2011-2014) in collaboration with Arizona State University to develop and formatively evaluate an online process-writing tool to support middle school students in writing informational and argumentative compositions. Dr. Hall is currently the PI on an OSEP funded "Stepping Up Technology" project, *The UDL Science Notebook: Scaling an Inclusive Solution to Sense Making in Science*. She is a frequent

speaker on the intersection of UDL and assessments for students with disabilities and has authored a number of book chapters and peer-reviewed articles on this topic.

**Robert Dolan, PhD (.3 FTE Y1-4)**, will serve on the assessment design team and will contribute to the development of testlets that meet the standards of UDL. Dolan brings 30+ years of experience in cognitive neuroscience, learning science, assessment, instructional design, and software architecture and engineering. He is an expert in applying UDL to assessment of diverse learners in terms of both pedagogy and technology integration. Prior to establishing his own consulting organization, Diverse Learners Consulting, in 2013, Robert spent thirteen years as a Senior Research Scientist at CAST (2000-2007) and Pearson (2007-2013). At both organizations he designed, implemented, and evaluated technology-based learning and assessment solutions with emphases on cognition, accessibility, and usability. He led the development of extensive guidelines for applying UDL to assessment design, and has focused on research and innovation at the intersections of formative assessment, adaptive learning, and educational data mining. He has served as principal investigator on research projects funded by the US DOE, NIH, NSF, and private foundations, and has served as research lead on multiple Enhanced Assessment Grants. Robert began serving as Adjunct Faculty at Landmark College's *Certificate in Universal Design: Technology Integration* program in 2016.

### **3. Qualifications of project consultants and subcontractors**

**Bruce Yelton, EdD, (External Evaluator; Contractual)**, brings thirty years of experience in the area of educational research and evaluation to this project. He received his undergraduate training in psychology at UNC-Chapel Hill and his doctorate at the University of Louisville. During his 30-year career as a researcher and evaluator he has participated in projects at the national, state and local levels on initiatives involving a wide range of topics. Particularly

significant among these have been intensive work in early childhood intervention, alternate assessment, second language acquisition, and remedial education. Dr. Yelton also served as a graduate instructor for research and statistics at UNC-Charlotte, Winthrop University, and Western Carolina University. He was chief operating officer of Praxis Research, Inc. for seventeen years and has been the proprietor of BYC Consulting since 2012. Currently Dr. Yelton serves as the state evaluator for the North Carolina INSPIRE alternative teacher certification program, is the project liaison with RTI International for a federal Institute of Justice school based mental health project, and is lead investigator for other LEA based projects in North Carolina.

**Project Consultants: the Project Governance Board (PGB).** The PGB is comprised of voting members from the partner states and advisory members (see Management Plan section for details about PGB structure and function). Advisory members have been recruited to serve on the PGB due to their relevant expertise. Advisory members of the PGB include:

**Karen Erickson, PhD,** Director of the Center for Literacy and Disability Studies, a Professor in the Division of Speech and Hearing Sciences, and the Yoder Distinguished Professor in the Department of Allied Health Sciences in the School of Medicine at the University of North Carolina at Chapel Hill. She is an associate director of the DLM Alternate Assessment Consortium and is co-developer of the Tar Heel Reader online library of accessible books for beginning readers.

**Neal Kingston, PhD,** Professor in Educational Psychology at KU, Director of the Achievement and Assessment Institute, and Senior Advisor to the DLM Consortium. His research focuses on improving large-scale assessments to better support student learning, especially by using fine-grained learning map models as an organizing structure for assessment.

**Cara Laitusis, PhD**, the Senior Research Director of the Student and Teacher Research Center at Educational Testing Service. She conducts research on the validity and fairness of assessments for all test takers, including field testing of new item types and test designs for students with disabilities on state assessments and admissions tests, using assistive technologies to increase accessibility on computer-based assessments, examining the validity of testing accommodations for students with disabilities on a variety of tests, and examining the comparability of paper-based and computer-based test formats.

**James W. Pellegrino, PhD**, is Liberal Arts and Sciences Distinguished Professor and Distinguished Professor of Education at the University of Illinois at Chicago, where he also serves as co-director of UIC's interdisciplinary Learning Sciences Research Institute. He currently serves on the Technical Advisory Committees for the SBAC, PARCC, DLM, and NCSC consortia of states funded under the USDOE Race to the Top assessment initiative.

**Jonathan Templin, PhD**, holds a joint appointment as a tenured Associate Professor in the Department of Educational Psychology and as an Associate Research Professor in the Achievement and Assessment Institute at KU. Dr. Templin's research focuses on diagnostic classification models.

**Michael L. Wehmeyer, PhD**, is the Ross and Mariana Beach Distinguished Professor of Special Education and Director of the Beach Center on Disability at KU. Dr. Wehmeyer is an internationally recognized expert in self-determination and access to the general education curriculum.

**Phoebe Winter, PhD**, is an independent consultant in assessment research and design. She conducts research in improving online assessment and contributes to the design of assessment

systems that incorporate technology. She brings policy, psychometric, and practical perspectives to the design and implementation of educational assessment and accountability programs.

## (F) ADEQUACY OF RESOURCES

### 1. Resources to Conduct the Project

**The Maryland State Department of Education.** MSDE is well positioned to be the lead applicant for this grant. Marsie Torchon, Education Program Specialist for Alternate Assessment, along with the MSDE Division of Curriculum, Assessment and Accountability, work collaboratively to administer and support the almost 4,300 students in Maryland with SCD, both in instruction and assessment. Maryland has participated in two federally-funded projects: a Race to the Top Grant to support a successful transition to the Common Core State Standards and the new PARCC assessment, and a supplemental grant to enhance instruction, curriculum and technology, to be used in assessment development. In addition, Maryland has participated as a Tier II state in another federal grant, which focused on the development of an alternate assessment based on modified achievement standards. Participation and support of these grants, as well as inclusion in the Council of Chief State School Officers (CCSSO) Assessment Special Education Students (ASES) and Technical Issues in Large Scale Assessment (TILSA) State Collaboratives on Assessment and Student Standards (SCASS), indicate the MSDE's commitment to building, maintaining, and evaluating state-mandated assessments that appropriately and effectively include students with disabilities.

**University of Kansas.** The project will be administered by the **Center for Educational Testing and Evaluation (CETE)** at KU. CETE resides within the Achievement and Assessment Institute (AAI), which provides support to CETE. The KU Center for Research (KUCR) is a not-for-profit research foundation responsible for the management of KU research grants and

contracts. KUCR is the parent organization of AAI and the signatory for AAI grants and contracts. CETE is an internationally recognized research center with over 150 staff members with expertise in test development, psychometrics, curriculum and instruction, professional development, editing, web design, and event planning. To support dissemination, CETE has a social media presence and a Communications Coordinator. CETE's offices are located in a building that contains conference rooms with videoconferencing capabilities. AAI and CETE maintain the necessary infrastructure to effectively support the scope of this project, including personnel and equipment. Researchers also have access to the many resources available through KU, including libraries and conference facilities. CETE has implemented two recent EAG-funded projects: *Accessibility of Technology-Enhanced Assessments* and *Use of Learning Maps as an Organizing Structure for Formative Assessment*. AAI is also the parent institute for Agile Technology Solutions (ATS), which will develop the online delivery systems for I-SMART.

**CAST, Inc.**, has successfully managed grants and contracts over the last 25+ years for the U.S. Department of Education, National Science Foundation, National Institutes of Health, and numerous private foundations, and has established the necessary technical monitoring, fiscal oversight, and management systems for leading and managing robust research projects. CAST's collaborative research team has expertise in cognition and learning, affective, emotional and social development, formative assessment, informal science learning design, UDL, advanced technical development and interface design, instructional design in technology-based interventions, and implementation of formative evaluation and experimental/quasi-experimental evaluations of instructional interventions. The CAST senior management team and cross-disciplinary staff are available as a resource to the project team. They provide vision and leadership in creative design, production, operations, resource development, and financial

management. The senior management team meets monthly to discuss the use of CAST resources and ensure that resources are used to the highest strategic advantage and are in keeping with CAST's mission. Each project PI also meets quarterly with the CAST Director of Finance to assess staffing and budgeting to ensure that projects are on time and on budget. Finally, the project team has full access to CAST's onsite, on-demand technical assistance staff who are available for resolving all technology-related issues.

**BYC Consulting** is a highly specialized research and evaluation firm that provides services to educational and human service organizations. BYC Consulting uses methodologies selected to maximize the usefulness and comprehension of data for stakeholders, often integrating qualitative and quantitative data. BYC Consulting adheres to the *Guiding Principles for Evaluators* developed and endorsed by the American Evaluation Association. BYC's operating principles stress the importance of informing all stakeholders about the objectives of any study and how the findings may impact them. Experimental, quasi-experimental, and causal-comparative research designs are used to provide descriptions of outcomes. Qualitative studies that include case study, interview, observation, and focus group methodologies are also used to provide greater insight and to validate quantitative findings. BYC Consulting provides expertise in exploring program theory models in educational settings with particular focus around the topics of early education, alternate assessment, language acquisition, and school improvement.

## **2. The relevance and demonstrated commitment of each partner**

Each partner brings unique expertise necessary to ensure project success. MSDE brings leadership in the delivery of instruction and assessment, including involvement in other multi-state consortia and collaborative groups. The other partner states are already members of one or more larger consortia and are familiar with the use of governance structures to serve advisory

functions and guide projects in meeting goals so that the end results are beneficial for teachers and students. CETE staff have expertise in learning map development, assessment design, psychometrics, research design, and delivery of computer-based assessments. CAST staff contribute expertise in cognition and learning; affective, emotional and social development; formative assessment, informal science learning design, UDL, advanced technical development and interface design, and instructional design in technology-based interventions. BYC Consulting has a long history of providing evaluation services for federally-funded projects including a previously funded EAG. Letters of commitment from all partners are provided in Part 6.

### **3. Adequacy of budget and 4. reasonableness of costs**

I-SMART proposes a wide scope of work (maps, assessments, reporting, and dissemination) with a relatively narrow segment of science content in grades 3-HS. This design choice was intentional. The budget supports an iterative design process so that each goal yields important outcomes but also informs development for subsequent goals. Cost efficiencies are recognized wherever possible. Meetings that involve participants from all of the states (e.g., PGB, map and testlet reviews, item writing) will take place in Maryland due to shorter travel distances and likely lower travel costs for participants in three of the partner states. Innovations also build on existing products. I-SMART will yield products that can be immediately used and project findings offer a model for future coherent and comprehensive assessment systems. Lessons learned will promote replicability across a wider range of science content once funding ends. Given the comprehensiveness of the objectives and the likelihood that final products will be very usable, the project costs are very reasonable in light of the significance of the project.

### (G) MANAGEMENT PLAN

The project will be administered by the Maryland State Department of Education (MSDE) and managed at CETE. The project activities will be accomplished through several teams. The relationships between teams and organizations are illustrated in the organization chart on page 65. The **Leadership Team** includes Karvonen (PI), Blackorby (co-PI), Swinburne Romine (co-PI), Research Project Manager TBH, and Bechard (Senior Advisor). This group will lead and direct project activities with advice from the PGB. The leadership team will meet biweekly to review the project timeline, steps toward implementation, and quality of work.

Four teams will report to the Leadership Team. The **Research Team** (Karvonen -- lead, Blackorby, Swinburne Romine, RPM, Andersen, Bechard, and Nash) will report to project leadership and be responsible for guiding decision making for the research and dissemination described in the project. The **Assessment Design Team** (Blackorby, Swinburne Romine – co-leads, RPM, Shipman, Ruhter, Dolan, Rose, Hall) will focus on the iterative development of innovative assessments described in Goal 2 using principles of UDL. This team will oversee item writing, external review and assessment delivery. The **Psychometric Team** (Nash-lead, Clark) is responsible for technical documentation and empirical validation of the map developed in Goal 1. The psychometric team is also responsible for Goal 2 analyses related to reliability, validity, and fairness; and the statistical component of the automated scoring system in support of Goals 2 and 3. The **Technology Team** (Martin-lead) is responsible for software development to support delivery of innovative testlets (Goal 2) and the reporting dashboard (Goal 3).

The project will benefit from the guidance of a **Project Governance Board (PGB)** that includes two representatives from each partner state (10 total) and 7 expert advisors (see Quality of Project Personnel section for information about advisors). Upon funding, the partner states

will develop a cooperative agreement that describes their relationship and the functioning of the PGB. Project staff at CETE and CAST will support PGB activities. The PGB will guide project leadership on decision-making, processes and products of the project, ensuring continuous improvements in design and delivery of high quality products. The PGB meets face to face annually and has regularly scheduled conference calls throughout each year. The PGB is chaired by Ms. Torchon (MSDE). Additional state representatives include: **Ann Herrmann**, Section Chief for MSDE; **Shaun Bates**, Director of Assessment, Missouri Department of Elementary and Secondary Education (DESE); **Lisa Sireno**, Standards and Assessment Administrator, DESE; **Elizabeth Celentano**, Education Program Assessment Specialist, New Jersey Department of Education (NJDE); **John Boczany**, Science Content Specialist, NJDE; **Kristen DeSalvatore**, Assistant Data Director in the Office of Information and Reporting Services, New York State Education Department (NYSED); **Vanessa Lee Mercado**, Supervisor in Educational Testing for Special Populations in the Office of State Assessment, NYSED; **Todd Loftin**, Executive Director of Special Education Services, Oklahoma State Department of Education (OSDE); **Christie Stephenson**, Director of Assessment in Special Education Services, OSDE.

**1. Adequacy of plan to achieve project objectives on time and within budget, including clearly defined responsibilities, timelines, and milestones for accomplishing project tasks.**

Each project goal has objectives that will inform the activities of later goals. The project activities are spread across four years to allow for the iterative development process described in the project design section. A preliminary project timeline with major activities each year is in the table that begins on the next page. The PD and PI will have oversight of the timelines, milestones, and budget, with input from the external evaluator and Leadership Team.

Activity	PR	2017				2018				2019				2020			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>0. Project Management</b>																	
Finalize partner contracts	1,2,4	x															
Hire key staff	2,3	x															
Convene governance board	2		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Submit performance report	1,2				x				x				x				x
<b>1. Learning Map Development</b>																	
Review literature	8	x	x														
Draft & refine map model	8		x	x													
Conduct external review	8			x													
<b>2. Assessment Development</b>																	
Review literature	3,4,7		x	x													
Revise testlet design	3,4,7			x													
Develop prototype EECMs	3,7				x												
Develop prototype testlets	4,7				x												
Review prototypes	6,7,8,9					x											
Plan research design (labs)	2,3,4,8				x	x											
Conduct item tryouts/labs	3,4,7						x										
Develop technology	10					x	x	x									
Develop full set of testlets	7							x									
Develop pilot research design	2,3,4,8,9						x	x									
Pilot new testlets	7								x	x							

Activity	PR	2017				2018				2019				2020			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Evaluate testlets	6,7,8,9,11										x	x	x				
Refine testlets from pilot	7													x	x		
<b>3. Reporting Dashboard</b>																	
Conduct needs assessment	4		x														
Develop & refine prototypes	4			x	x												
Develop automated scoring	9										x	x	x				
Develop research design	2,4,8,9											x	x				
Evaluate interpretation & usability	6,8,9													x	x		
<b>4. Dissemination</b>																	
Develop project website	5, 6		x														
Create dissemination plan	2,5					x	x										
Develop project briefs	5						x				x				x		x
Develop technical reports	5, 8, 9						x	x	x	x	x	x	x	x	x	x	x
Disseminate findings	5,6,8,11							x				x				x	x

The management plan builds on existing processes and relationships, including interrelated teams at CETE. I-SMART also requires close collaboration between CETE and CAST. Staff of these organizations will collaborate closely on research design in Goals 2 and 3, assessment design and development, and dissemination. CETE staff will primarily oversee Goal 1 learning map development, Goal 2 assessment pilot study design and analyses, and software development

for Goals 2-3. CAST staff will primarily oversee design and development of student item tryouts in Goal 2 and dashboard design and development in Goal 3. Primary responsibilities are noted in the project timeline.

**2&3. Adequacy of procedures for ensuring feedback and continuous improvement and high-quality products and services.**

The management plan includes several mechanisms for ensuring continuous improvement and excellent outcomes. The PGB includes a decision-making group (i.e., the state representatives) and advisory members to guide the project in applying appropriate methods, using current research and practice, and ensuring relevance for educators. The Leadership Team will monitor project activities and deliverables. The external evaluator will update the implementation checklist quarterly and will provide written evaluation updates at 6-month intervals. The PD, PI, and RPM will have regular communication to ensure the success of overall project oversight including fiscal management, evaluation, and goal attainment.

**4. Appropriateness and adequacy of time commitments to meet the objectives.**

I-SMART is appropriately staffed to meet the project objectives. The PD will devote .20 FTE annually to project oversight including communication with OESE staff, chairing the PGB, and managing reporting requirements. She will be supported by another MSDE staff member, Ms. Herrmann, who will devote .10 FTE to the project. The PI and co-PIs offer a combined .55 FTE per year to provide leadership in accomplishing the project's goals while the fully dedicated RPM will support effective coordination across teams and organizations. Additional key personnel from CETE and CAST have varying time commitments per year that are based on the need for their expertise on specific goals and objectives and their ongoing involvement on their

respective teams throughout the project. Overall, key staff provide 12.2 FTE for I-SMART in addition to the effort of other staff, PGB members, and the external evaluator.

## (H) QUALITY OF THE PROJECT EVALUATION

### **1. Methods are thorough, feasible, and appropriate to the goals, objectives, and outcomes.**

The I-SMART evaluation plan is designed to address two broad aspects of the project: implementation (process) and outcomes. This section provides an overview of the preliminary evaluation plan. The plan will be finalized with input from the Leadership Team (LT) and Project Governance Board (PGB). The PI will have administrative oversight for implementation of the plan. The external evaluator, BYC Consulting, and CETE staff will share responsibility for the process evaluation. The PI will oversee the outcome evaluation conducted by the external evaluator. The evaluation will follow principles of utilization-focused evaluation (Patton, 1997) and will be designed and conducted to promote decision-making by the end users, including the state partners and key staff. Annual and final performance reports will be provided on a schedule determined by OESE. Summative evaluation data will be available in the final quarter of the project. The evaluation will be conducted in a manner consistent with the *Program Evaluation Standards* set by the Joint Committee on Standards for Educational Evaluation (Yarborough, Shulha, Hopson, & Caruthers, 2011) of the American Evaluation Association.

*Process evaluation.* The purpose of the process evaluation will be to monitor project implementation. Process evaluation will focus on activities conducted at the project level, not within states. In the first month, the PI, RPM, and external evaluator will develop an implementation timeline containing a detailed list of steps to implement each goal and objective currently summarized in the Project Design. For each checklist item, staff will identify individuals responsible for implementation, the time frame for completion, and any expected

products/deliverables. The group will also identify any changes or challenges that may potentially hinder goal completion and discuss how these will be addressed. The PI, RPM, and evaluator will review the implementation timeline each quarter and update the document based on the status of program implementation. This process will help the Leadership Team ensure the project is being fully implemented on schedule and to identify places where actual implementation may have deviated from planned implementation.

*Outcome evaluation.* Outcome evaluation will primarily consist of questions posed about each of the four project goals. Questions focus on goal attainment rather than duplicating research activities that are themselves evaluative in nature (e.g., Goal 1 evaluation of learning map model; Goal 2 evaluation of piloted testlets). A fifth question focuses on the SEA role in guiding the project. The final evaluation plan will also include performance measures required by OESE. Preliminary evaluation questions are: (1) Is a cognitive map model to describe student science learning produced? (2) Are valid, reliable, and “real world” usable testlets based on learning map models developed for use in assessment for students in the target populations? (3) Was a functional prototype of the data dashboard developed and tested with teachers? (4) To what degree do representatives from the participating states access and share information about the project? and (5) Do state partners believe that they played a valued role in the research project and that it produced significant results?

**2. Evaluation methods include objective performance measures clearly related to the intended project outcomes and will produce quantitative and qualitative data.**

Question 1 will be evaluated using documentation of the map model development and review processes; observation of the expert panel review procedure and group interview with expert panel to ascertain the effectiveness of the review process; and documentation of new content

development, internal review, and analysis of map structure. Question 2 will be answered using documentation on the literature review, testlet framework, EECM design, and testlet prototype development; and structured telephone interviews with a random sample of teachers participating in the pilot to ascertain their perceptions regarding testlet administration. Question 3 will be answered using documentation about the dashboard development process. Question 4 will be answered using project website traffic data, and social media participation measures. Question 5 will be answered through focus groups with state partners to gather feedback on their involvement in I-SMART development, and the value of the results.

Outcome evaluation data will be collected at logical points within the project implementation timeline. Notes and meeting recordings will be conducted when those meetings are scheduled. Web conferences will be recorded and downloaded for later analysis. Researcher logs and project documents will be collected throughout the project. Brief structured interviews will be conducted with state partners in the first quarter of the project, with more extensive interviews in the final quarter. Phone interviews with teachers will be conducted at the end of the Goal 2 pilot test. Data archives will be created and indexed prior to analysis. Quantitative data will be summarized with descriptive statistics. Audio recorded data sources will be converted to tape-based transcripts, with the exceptions of key informant interviews, which will be transcribed verbatim prior to analysis. Narrative analysis will be used to generate descriptions of how the evaluation questions are answered. Several features of the evaluation will promote confirmability, credibility and trustworthiness of the findings (Miles, Huberman, & Saladana, 2014). Triangulation of methods and data sources will allow for consistency checks within each case. State partners will be asked to member-check preliminary summaries of evaluation findings.

**3. Evaluation methods will provide performance feedback and permit periodic assessment of progress toward achieving intended outcomes.**

I-SMART is a collaborative project with multiple organizations. The implementation checklist used for process evaluation and project management will be critical for helping the Leadership Team monitor and adjust implementation to ensure project success. The Leadership Team and PGB will receive evaluation updates at six month intervals and will be asked to provide suggestions for formative project adjustments at the interim points as needed.

**4. The evaluation will provide guidance on effective strategies suitable for replication or testing in other settings.**

The utilization-focused approach to I-SMART evaluation will maximize information for key stakeholders including partner states, other state agencies, and researchers who may be interested in replicating project activities. Evaluation results will offer evidence about what I-SMART activities and deliverables were perceived as beneficial to states. Transferability of methods and findings will be enhanced through data collection in multiple states and with diverse populations. Potential transferability will also be assessed through interviews with state partners. Outcome evaluation findings will include specific conclusions about facilitators and barriers other states may consider if they use similar techniques to develop science learning map models, assessments, and reporting dashboards.

**(I) STRATEGY TO SCALE**

**1. Capacity to develop and bring to scale processes, products, strategies, and practices.**

The partner organizations have capacity to develop and bring to scale I-SMART processes and products. CETE leadership has demonstrated effective project management, stakeholder involvement, and engagement in inclusive decision-making practices in the DLM consortium.

An external evaluation on the 2010-2015 ELA and math GSEG project included surveys of state partners (McREL, 2015), indicating that key successes were: (1) the development and implementation of the EEs and learning map models, and cohesion between them; (2) collaboration and communication among DLM and SEA staff; and (3) the ability work with a large consortium of states (n=18). The most immediate opportunity to scale up is to apply findings to the DLM science AA-AAS. There is some overlap between the I-SMART states and the currently operational DLM science consortium states. I-SMART findings will be shared with the consortium Governing Board to aid in planning long-term priorities for development of map, assessments and score reports. The DLM science consortium maintains an annual budget for development and shares goals consistent with the vision of I-SMART. If the consortium does adopt I-SMART processes and products there is a secondary impact on more than 35,000 students with SCD in 10 or more states. I-SMART will also support for future scale-up efforts by others who wish to apply the design and development processes to additional science topics and extend the project's products to other populations. The PGB will help develop guidelines and a licensing agreement for the use of I-SMART products to facilitate this scale-up.

## **2. Mechanisms for dissemination.**

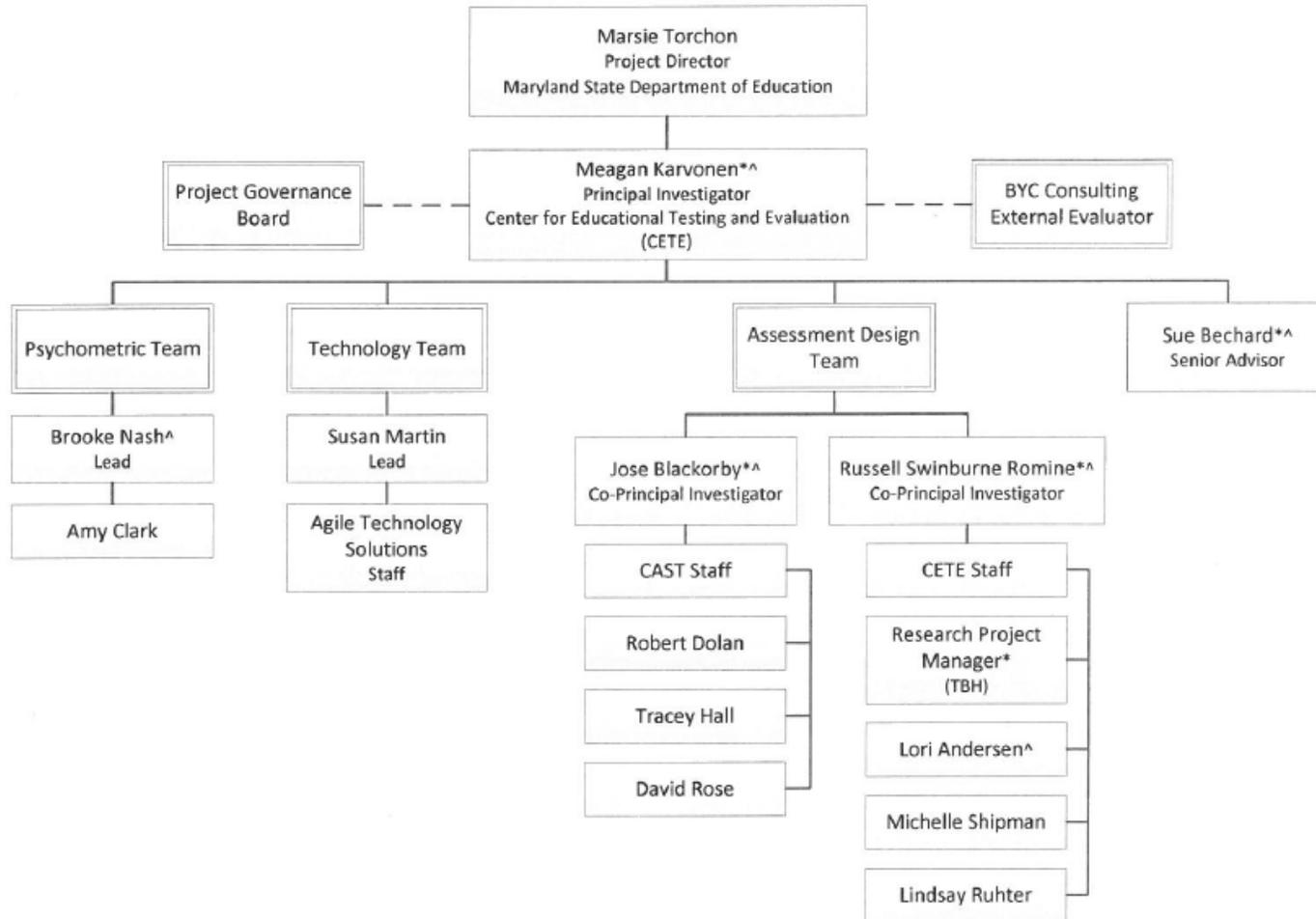
Development and replication after I-SMART ends will be facilitated by the dissemination plans (see Project Design, Goal 4 for details) that include multiple products (e.g., project briefs, full research papers) and channels for dissemination (e.g., conferences, publications, NCEO, social media) to a variety of audiences (e.g., teachers, policy makers, assessment developers). The PGB will provide advice on how to maximize the utility of I-SMART products. PGB members will promote dissemination in their states and through their membership in other organizations. Products will describe practical implications in assessment design and

administration, students' development of science content knowledge, and uses of assessment results to guide instruction.

### **3. Unmet demand to enable scale-up**

Most current science curricula, instruction, and assessments are based on outdated models of science learning and accessibility. The demand for research-based science learning maps; engaging, multidimensional assessments; and dynamic reporting will continue to grow. ESSA (2015) ensured that states' assessments will continue in science. States need models that support increasing depth of understanding of core ideas over time with opportunities for students to engage in science and engineering practices. Most large-scale assessments, including AA-AAS, are year-end measures that do not provide timely feedback that could be used to inform instructional decisions. It is important in planning for scale-up to continue development of the science map to cover the remaining NGSS science topics and to develop additional instructionally relevant assessments to aid educators in instructional planning.

## Innovations in Science Map, Assessment, and Report Technologies Key Personnel & Management Structure



\* denotes members of the Project Leadership Team  
 ^ denotes members of the Research Team

# Innovations in Science Map, Assessment, and Report Technologies (I-SMART)

CFDA 84.368A

## Part 6 Contents (Attachments)

1. Individual Resumes for Project Directors and Key Personnel
  - a. Marsie Torchon, Project Director
  - b. Meagan Karvonen, Principal Investigator
  - c. Jose Blackorby, Co-Principal Investigator
  - d. Russell Swinburne Romine, Co-Principal Investigator
  - e. Additional resumes for key personnel at University of Kansas
  - f. Additional resumes for key personnel at CAST
  - g. Additional resumes for key personnel at BYC Consulting
2. Letter of Commitment from Maryland State Department of Education
3. Indirect Cost Rate Agreements
  - a. Maryland State Department of Education
  - b. University of Kansas
  - c. CAST
4. Letters of Commitment and Support
  - a. Collaborating states
    - i. Missouri Department of Elementary and Secondary Education
    - ii. New Jersey Department of Education
    - iii. New York State Department of Education
    - iv. Oklahoma State Department of Education
  - b. Partner organizations
    - i. University of Kansas
    - ii. Center for Educational Testing & Evaluation
    - iii. CAST
    - iv. BYC Consulting
    - v. National Center on Educational Outcomes
  - c. Project Governance Board Advisory Members
    - i. Karen Erickson
    - ii. Cara Laitusis
    - iii. Neal Kingston
    - iv. James Pellegrino
    - v. Jonathan Templin
    - vi. Michael Wehmeyer
    - vii. Phoebe Winter
5. References for the Project Narrative

6. Lobbying Disclosure Forms
  - a. University of Kansas Center for Research
  - b. CAST
  - c. BYC Consulting

# Martha (Marsie) A. Torchon

757-335-0167

## EDUCATION

2001 BS, James Madison University, Psychology, with special education teaching certification (LD, MR, ED K-12) and minor in Special Education

## Relevant Professional Experience

### Maryland State Department of Education (2016 - present)

Education Program Specialist - Alternate Assessments

- Duties include:
  - planning, implementation and support of all state Alternate Assessments for students with significant cognitive disabilities.
  - Support of implementation and use in assessment for all accommodations for all Maryland students.

### Pearson, Performance Scoring (2007-2016)

#### Scoring Specialist

As a scoring professional, Mrs. Torchon is responsible for facilitating the accurate and timely delivery of national, state, and district wide large-scale assessments. Her duties include:

- Attending state range finding sessions to define and comprehend state and national criteria
- Communicating with customer representatives and respond to customer needs
- Conducting initial and continual training of large groups to ensure adherence to national, state, and district criteria
- Maintaining scorer accuracy through calibration and individual intervention
- Monitoring scorer rate to determine project progression and scorer effectiveness
- Monitoring reports across grades and items to verify quality expectations are met and project completes on time. Works with Scoring Directors to address quality issues, and communicates plans/issues to Content Specialist and Project Manager.
- Providing effective leadership of team of scoring directors, supervisors, and scorers
- Communicating with management regarding project expectations and progress

Ms. Torchon's past and present projects include:

- 2009-2016
  - Scoring Specialist, National Board for Professional Teaching Standards (NBPTS), Exceptional Needs
- 2008 - 2016
  - Scoring Director, Alternate Maryland School Assessment (Alt-MSA), Grades 3-8, 10
- 2014-2016

- Scoring Director, Partnership for Assessment of Readiness for College and Careers (PARCC), Grade 3,11 ELA and Mathematics
- 2012
  - Item Writer, Georgia Formative Item Bank (GAFIB), English Language Arts
    - Developed multiple constructed response items in English Language Arts across grade levels.
- 2008-2010
  - Scoring Director, Virginia Alternate Assessment Program (VAAP), Grades 3-12
- 2008
  - Scoring Director, Washington Alternate Assessment System (WAAS)
  - Trainer, National Assessment of Educational Progress (NAEP) Grades 4 and 8 Reading
- 2007
  - Scorer, Michigan Educational Assessment Program (MEAP) Grade 7 writing
  - Scorer, Washington Assessment of Student Learning (WASL) Grades 3 and 5 reading pilot
  - Scorer, Virginia Alternate Assessment Program (VAAP)
  - Scorer, Washington Assessment of Student Learning (WASL) Grade 3 reading
  - Scorer, National Assessment of Educational Progress (NAEP) Grade 8 holistic writing
  - Scorer, Maryland Alternate School Assessment (Alt-MSA), Grades 3-8, 10 Priority 1 Research Study
  - Scorer, Maryland Alternate School Assessment (Alt-MSA), Grades 3-8, 10

## **Chesapeake Public Schools (2001-2004), Chesapeake, Virginia**

### **Special Education Teacher**

Taught students with mild, moderate, and significant disabilities. Responsibilities included: direct instruction and planning for students with special needs, IEP writing, curriculum and unit creation, city-wide staff development for curriculum and IEP creation; Virginia certified through June, 2016 (classes completed for recertification through 2021).

### **Recent Education**

University of Virginia - EDU-C375 Assessment & Evaluation in Special Education

**ABBREVIATED CURRICULUM VITAE**  
**Meagan Karvonen**

**EDUCATION**

---

- Ph.D.           University of South Carolina  
                  Educational Psychology and Research (Research Track)
- M.A.            University of North Carolina at Charlotte  
                  Clinical and Community Psychology
- B.A.            Alma College  
                  Psychology (*cum laude*)

**CURRENT POSITION**

---

**University of Kansas**

- 2013 – present   Associate Director, Center for Educational Testing and Evaluation  
                          Courtesy appointment, Department of Educational Psychology
- 2015 – present   Director, Dynamic Learning Maps Alternate Assessment Consortium

**SELECTED PUBLICATIONS**

---

***Books and Book Chapters***

---

- Karvonen, M., Wakeman, S., & Kingston, N., (in press). *Alternate Assessment*. In Wehmeyer, M. L., & Shogren, K. A. (Eds.). *Handbook of research-based practices for educating students with intellectual disability*. New York, NY: Routledge.
- Wakeman, S. Y., Browder, D. M., Flower, C., & Karvonen, M. (2011). Alternate achievement standards for alternate assessments: Considerations for policy and practice. In M. Russell & M. Kavanaugh (Eds.), *Assessing Students in the Margins: Challenges, Strategies, and Techniques*. Charlotte, NC: Information Age Press.
- Karvonen, M. (2010). Developing standards-based Individualized Education Programs that promote effective instruction. In M. Perie (Ed.), *Teaching and Assessing Low-Achieving Students with Disabilities: A Guide to Alternate Assessments Based on Modified Achievement Standards* (pp. 33-65). Baltimore, MD: Paul H. Brookes Publishing.
- Almond, P., & Karvonen, M. (2007). Accommodations for a K to 12 standardized assessment: Practical implications for policy. In C. Cahalan Laitusis & L. L. Cook (Eds.), *Large-scale assessment and accommodations: What works?* (pp. 117-136). Arlington, VA: Council for Exceptional Children.

***Journal Articles***

---

- Kingston, N. M., Karvonen, M., Bechard, S., & Erickson, K. (2016). *The philosophical underpinnings and key features of the Dynamic Learning Maps Alternate Assessment*. *Teachers College Record (Yearbook)*, 118(14). Retrieved from <http://www.tcrecord.org> ID Number: 21546.
- Karvonen, M., Flowers, C., & Wakeman, S. (2013). Factors associated with access to the general curriculum for students with intellectual disability. *Current Issues in Education*, 16(3), 10. Retrieved from <http://cie.asu.edu/ojs/index.php/cieatasu/article/view/1309>

- Karvonen, M., Wakeman, S., Moody, S., & Flowers, C. (2013). The relationship of teachers' instructional decisions and beliefs about alternate assessments to student achievement. *Exceptionality, 21*, 238-252. doi: 10.1080/09362835.2012.747184
- Marshall, K. J., Karvonen, M., Yell, M. L., Lowery, K. A., Drasgow, E., & Seaman, M. A. (2013). Project Respect: Toward an empirically based teacher mentoring model. *Journal of Disability Policy Studies, 24*, 127-136. doi: 10.1177/1044207313480837
- Wakeman, S., Karvonen, M., & Ahumada, A. (2013). Changing instruction to increase achievement for students with moderate to severe intellectual disabilities. *Teaching Exceptional Children, 46*(2), 6-13.
- Flowers, C., Wakeman, S., Browder, D. M., & Karvonen, M. (2009). Links for Academic Learning: A conceptual model for investigating alignment of alternate assessment systems based on alternate achievement standards. *Educational Measurement: Issues and Practice, 28*(1), 25-37. doi: 10.1111/j.1745-3992.2009.01134.x
- Browder, D. M., Wakeman, S. Y., Flowers, C., Rickelman, R. J., Pugalee, D., & Karvonen, M. (2007). Creating access to the general curriculum with links to grade level content for students with significant cognitive disabilities: An explication of the concept. *Journal of Special Education, 41*(1), 2-16. doi: 10.1177/00224669070410010101
- Karvonen, M., Wakeman, S. L., Flowers, C. P., & Browder, D. M. (2007). Measuring the enacted curriculum for students with significant cognitive disabilities: A preliminary investigation. *Assessment for Effective Intervention, 33*(1), 29-38. doi: 10.1177/15345084070330010401
- Karvonen, M., & Huynh, H. (2007). The relationship between IEP characteristics and test scores on alternate assessments for students with significant cognitive disabilities. *Applied Measurement in Education, 20*(3), 273-300. doi: 10.1080/08957340701431328
- Karvonen, M., Flowers, C. P., Browder, D. M., Wakeman, S., & Algozzine, B. (2006). Case study of the influences on alternate assessment outcomes for students with disabilities. *Education and Training in Developmental Disabilities, 41*(2), 95-110.
- Browder, D., Ahlgrim-Delzell, L., Flowers, C., Karvonen, M., Spooner, F., & Algozzine, R. (2005). How states implement alternate assessments for students with disabilities: Recommendations for national policy. *Journal of Disability Policy Studies, 15*, 209-220. doi: 10.1177/10442073050150040301
- Browder, D. M., Karvonen, M., Davis, S., Fallin, K., & Courtade-Little, G. (2005). The impact of teacher training on state alternate assessment scores. *Exceptional Children, 71*, 267-282.
- Browder, D. M., Flowers, C., Ahlgrim-Delzell, L., Karvonen, M., Spooner, F., & Algozzine, B. (2004). The alignment of alternate assessment content with academic and functional curricula. *Journal of Special Education, 37*(4), 211-223. doi: 10.1177/00224669040370040101
- Browder, D. M., Spooner, F., Ahlgrim-Delzell, L., Flowers, C., Algozzine, R., & Karvonen, M. (2003). A content analysis of the curricular philosophies reflected in states' alternate assessments. *Research and Practice for Persons with Severe Disabilities, 28*(4), 165-181.
- Browder, D. M., Spooner, F., Algozzine, R., Ahlgrim-Delzell, L., Flowers, C., & Karvonen, M. (2003). What we know and need to know about alternate assessment. *Exceptional Children, 70*(1), 45-61.
- Algozzine, B., Browder, D., Karvonen, M., Test, D. W., & Wood, W. M. (2001). Effects of interventions to promote self-determination for individuals with disabilities. *Review of Educational Research, 71*(2), 219-277. doi: 10.3102/00346543071002219

## SELECTED PRESENTATIONS

---

- Karvonen, M., Burton, K., Matthews, D., Gholson, M., & Mayer, T. (2016, June). *Actionable alternate assessment score reports: Supporting instruction and high expectations for students with significant cognitive disabilities*. Presentation at the 2016 Council of Chief State School Officers National Conference on Student Assessment, Philadelphia, PA.

- Whisler, K., Cortez, T., Karvonen, M., & Conrad, Z. (2016, June). *Building equitable NGSS assessment systems for all students: Comparing notes between general and alternate NGSS assessment development*. Roundtable session at the 2016 Council of Chief State School Officers National Conference on Student Assessment, Philadelphia, PA.
- Karvonen, M., Clark, A. K., & Kingston, N., (2016, April). *Alternate assessment score report interpretation and use: Implications for instructional planning*. Presentation at the 2016 annual meeting of the National Council on Measurement in Education, Washington, DC.
- Karvonen, M., Swinburne Romine, R., & Clark, A. K. (2016, April). *Validity evidence to support alternate assessment score uses: Fidelity and response processes*. Presentation at the 2016 annual meeting of the National Council on Measurement in Education, Washington, DC.
- Karvonen, M., & Perie, M., (2016, April). *Performance assessments and classroom instruction: Dynamic Learning Maps Consortium perspective*. Presentation at the 2016 annual meeting of the National Council on Measurement in Education, Washington, DC.
- Lawrence, A., Karvonen, M., Wells-Moreaux, S. (2016, April). *Accessibility supports and implications for educator decisions*. Presentation at the 2016 annual meeting of the Council for Exceptional Children, St. Louis, MO.
- Karvonen, M., Burton, K., Henke, T., Gholson, M., & Keating, N. (2015, June). *Supporting implementation of the Dynamic Learning Maps alternate assessment system: States' perspectives and lessons learned*. Presentation at the 2015 Council of Chief State School Officers National Conference on Student Assessment, San Diego, CA.
- Karvonen, M., Zeller, M., Thompson, J.R., (2015, June). *Advances in assessment for children and youth with Intellectual Disability*. Preconference session at the American Association on Intellectual and Developmental Disabilities (AAIDD) annual conference, Louisville, KY.
- Lazarus, S., Williams, L., Karvonen, M., Gholson, M., & Wheeler, T. (2015, June). *Test security policies and procedures for alternate assessments*. Presentation at the 2015 Council of Chief State School Officers National Conference on Student Assessment, San Diego, CA.
- Clark, A. K., Karvonen, M., Kingston, N., Anderson, G., & Wells-Moreaux, S. (2015, April). *Designing alternate assessment score reports that maximize instructional impact*. Paper presented at the annual meeting of the National Council on Measurement in Education, Chicago, Illinois.
- Karvonen, M., Bechard, S., & Wells-Moreaux, S. (2015, April). *Accessibility considerations for students with significant cognitive disabilities who take computer-based alternate assessments*. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.
- Swinburne Romine, R., Karvonen, M. & Clark, A. K. (2015, April). *Gathering evidence of response processes for alternate assessments (AA-AAS)*. Paper presented at the annual conference of the National Council for Measurement in Education, Chicago, IL.
- Wells-Moreaux, S., Karvonen, M., & Kingston, N. (2015, April). *Accessibility by design: Improving alternate assessments for students with significant cognitive disabilities*. Presentation at the annual meeting of the Council for Exceptional Children, San Diego, CA.
- Karvonen, M., & Erickson, K. (2015, January). *Accessibility by design: The Dynamic Learning Maps Alternate Assessment System*. Presentation at the 2015 conference of the Assistive Technology Industry Association, Orlando, FL.
- Erickson, K., & Karvonen, M. (2014, July). *College and career readiness instruction and assessment for pre-intentional and pre-symbolic communicators*. Presentation at the annual conference of the U.S. Department of Education (ED) Office of Special Education Programs (OSEP) Project Directors, Washington, DC.
- Kingston, N. M., Karvonen, M., & Thatcher, E. (2014, July). *Alternate assessment data in support of local decision making*. Presentation at the annual conference of the ED OSEP Project Directors, Washington, DC.
- Bechard, S., Karvonen, M., Clark, A., Cagle, G., & Felix, A. (2014, June). *Computer-based testing for students with significant cognitive disabilities: Challenges and opportunities in the next generation*. Presentation at the annual National Conference on Student Assessment (NCSA), New Orleans, LA.

- Kingston, N. M., Karvonen, M., & Studt, N. (2014, June). *School readiness: Lessons learned during DLM field testing*. Presentation at the annual NCSA, New Orleans, LA.
- Weigert, S., Karvonen, M., Hall, S., Gholson, M., Williams, L., Cagle, G., & Wheeler, T. (2014, June). *Policies and practices in support of the transition to next generation alternate assessments based on alternate achievement standards*. Presentation at the annual NCSA, New Orleans, LA.
- Karvonen, M. (2014, April). *Research, opportunities, and challenges in using technology and testing accommodations*. Panelist at the AERA Inclusion and Accommodation in Educational Assessment SIG business meeting, Philadelphia, PA.
- Karvonen, M., Flowers, C., & Wakeman, S. (2014, April). *Alternate assessments based on alternate achievement standards (AA-AAS): Item features and student outcomes*. Paper presented at the annual meeting of the American Educational Research Association, Philadelphia, PA.
- Karvonen, M., Wakeman, S., & Ahumada, A. (2014, April). *Using growth models of AA-AAS student performance within a teacher effectiveness system*. Presentation at the Council for Exceptional Children Convention and Expo, Philadelphia, PA.
- Montrosse-Moorhead, B., & Karvonen, M. (2013, October). *Educational leaders' practices surrounding the interpretation and use of data in K-12 settings*. Poster presented at the annual conference of the American Evaluation Association, Washington, DC.
- Karvonen, M., Flowers, C., & Wakeman, S. (2013, April). *An exploration of methods for measuring academic growth for students with significant cognitive disabilities*. Paper presented at the 2013 annual meeting of the American Educational Research Association.
- Barton, K., & Karvonen, M. (2012, June). *Providing a technology-driven teacher support system for differentiated instruction and individualized student learning: Evaluation results and lessons learned*. Paper presented at the 2012 Council of Chief State School Officers National Conference on Student Assessment, Minneapolis, MN.
- Karvonen, M. (2009, November). *Alignment of alternate assessments and state decisions about system improvement: A multi-case study of four states*. Paper presented at the American Evaluation Association's Evaluation 2009 Conference, Orlando, FL.
- Karvonen, M. (2009, April). Discussant for "*Alternate assessment based on alternate achievement standards: Improving technical rigor.*" Invited symposium at the annual meeting of the National Council on Measurement in Education, San Diego, CA. **Invited.**

## **SELECTED EXTERNAL FUNDING AND OTHER PROFESSIONAL ACTIVITIES**

---

- Served as PI or co-PI on projects totaling \$29.6 million, including contracts for operational assessment and federally-funded research and development project
- National Council on Measurement in Education Diversity and Testing Committee (Co-Chair, 2014-15; Chair, 2015-16; Past Chair, 2016-17)
- Consultant for reliability study on the ISTAR alternate assessment, Indiana Department of Education (2012)
- Conducted standard setting study on Biology alternate assessment, Indiana Department of Education (2011)
- Research Associate, *Project SALLSA*, Enhanced Assessment Grant awarded to the Pennsylvania Department of Education (2007 - 2008)
- Consultant, *Targeting Research to Investigate Alternate Assessment Development (TRIAAD)*, IDEA General Supervision Enhancement Grant awarded to the South Carolina Department of Education (2008 – 2012)
- Faculty Research Associate, National Alternate Assessment Center (2005 - 2009)

## **CURRICULUM VITAE**

### **JOSE BLACKORBY**

CAST, Inc.

40 Harvard Mills Square, Suite 3

Wakefield, MA 01880

781-245-2212 jblackorby@cast.org

#### **ACADEMIC BACKGROUND**

Ph.D., Special Education, 1991, University of Washington

M.A., Germanics, 1985, University of Washington

B.A., Fine Arts, 1982, Colgate University

#### **CURRENT POSITION**

Senior Director of Research and Development

#### **SPECIALIZED PROFESSIONAL COMPETENCE**

Large-scale evaluation and intervention research, with a focus on exceptional and disadvantaged populations.

#### **REPRESENTATIVE RESEARCH ASSIGNMENTS (SINCE 1991)**

Principal Investigator, Goal 3 Study of the Efficacy of Science Notebook funded by U.S.

Department of Education, IES.

Co-Principal Investigator of Digital Resource for Preservice Math Teachers (Dynabook) funded by the National Science Foundation, which used using TCPK and UDL to support teaching and learning of proportionality.

Co-Principal Investigator of IES-funded Learning Progressions in Number Sense. Formative assessment system for students with learning disabilities.

Co-Principal Investigator of Capacity Building Agenda for Online STEM Learning for students with disabilities funded by the National Science Foundation.

Principal Investigator, i3 GIST funded by U.S. Department of Education, i3 Development grant, 2015-18. Developing mobile technology enabled supports for secondary social studies and science.

Principal Investigator, Montana Striving Readers (CSR-CO), funded by U.S. Department of Education, Partnership Grant, 2015-17. Improvement science effort to enhance the Montana Striving Readers (IES).

Principal Investigator, Collaborative Strategic Reading Colorado (CSR-CO), funded by U.S. Department of Education, i3 Validation grant, 2011-14. Conducting randomized controlled trial of the effect of CSR on student and teacher outcomes.

Principal Investigator, Unconditional Education funded by U.S. Department of Education, i3 Development grant, 2013-16. Conduct QED on the effect of UE achievement and school climate.

Task Leader, IES-funded National Evaluation of RtI Strategies, which is examining the impact of RtI strategies on the reading performance of the students identified for Tier 2 services.

Principal Investigator. Under subcontract with Michigan Department of Education, conducting a 4-year impact evaluation of Michigan's FUSION Reading for Striving Readers in 10 high schools. Students are the unit of assignment and analysis.

Principal Investigator of the IES-funded Design and IDEA-related Analyses for the National Assessment (DIANA). Design and conduct studies to add to extant data analyses, surveys, and impact studies to address the range of pertinent evaluation questions for assessing IDEA.

Co-Principal Investigator, Evaluation of the Effects of the Intel Reader on Improving the Reading Performance of Adolescents with Learning Disabilities, study conducted for the Intel Digital Health Group.

Senior Researcher, National Center and State Collaborative GSEG, developed assessment tasks for students with significant cognitive disabilities using evidence-centered design (ECD) and universal design for learning (UDL) to develop assessment tasks for Common Core State Standards (CCSS) in mathematics and English language arts.

Principal Investigator of the IES-funded National Study on Alternate Assessments (NSAA). Examined the change in alternate assessment systems for students with cognitive disabilities in states through the creation of state and national profiles, case studies in selected states, and a quantitative analysis of the association between system characteristics and student outcomes.

Project Director of Analytic Support Task for IDEA National Assessment funded by IES. Used extant data sources for six studies over 3 years to examine issues critical to outcomes and services for students with disabilities.

Project Director of SRI subcontract to MPR funded by IES What Works Clearinghouse (WWC). Reviewed evidence in selected outcome domains for dissemination to the public through WWC.

Project Leader of Montana Striving Readers Project, Montana State Dept. of Public Instruction. Provided technical assistance to six underperforming schools to identify and implement initial and ongoing progress monitoring assessments, and assisting schools in the selection of evidence-based interventions that can be implemented in a multitiered system of supports.

Co-director of the Special Education Elementary Longitudinal Study (SEELS), which involved a nationally representative sample of 11,500 6- to 12-year-old students receiving special education over 5 years. Data was collected that assessed growth in students' reading fluency and comprehension and mathematics calculation and problem solving, and student self-concept and attitudes toward school.

Project Director of the ED-funded Evaluation of the Following the Leaders (FTL) Program, which examined the effects of online-delivered FTL interventions in 16 states using state accountability test data.

Project Director of the NSF-funded Study of Persons with Disabilities in Science, Engineering Mathematics, and Technology, which examined the participation rates and factors associated with STEM participation among individuals with disabilities.

Deputy Director, Disability Support for the Early Childhood Longitudinal Study-K, which provided design expertise to support the inclusion of students with disabilities in the ECLS-K, including oversampling, instrumentation, and assessment and accommodation design.

#### **SELECTED PUBLICATIONS**

Blackorby, J., Lenz, K., Campbell, A., & Wei, X. (2015). *Evaluation of CSR Colorado*. Denver, CO: Denver Public Schools.

Courey, S. J., LePage, P., Siker, J. R., Roschelle, J., & Blackorby, J. (2015). Preparing middle school mathematics teachers: Rethinking engagement and learning. *The Mathematics Enthusiast*.

- Jenkins, J. R., Schiller, E., Blackorby, J., Thayer, S. K., & Tilly, W. D. (2013). Responsiveness to Intervention in reading architecture and practices. *Learning Disability Quarterly*, 36(1), 36-46. doi: 10.1177/0731948712464963
- Wei, X., Yu, J., Shattuck, P., McCracken, M., & Blackorby, J. (2013). Science, technology, engineering, and mathematics (STEM) participation among college students with an autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 43, 1539-1546.
- Wei, X., Christiano, E., Yu, J., Blackorby, J., Shattuck, P., & Newman, L. (2013). Postsecondary pathways and persistence for STEM versus non-STEM majors among college students with an autism spectrum disorder. *Journal of Autism and Developmental Disorders*. doi: 10.1007/s10803-013-1978-5
- Wei, X., Lenz, K. B., & Blackorby, J. (2013). Math growth trajectories of students with disabilities: Disability, gender, race, and SES differences from ages 7 to 17. *Remedial and Special Education*. Published online 16 July 2012. doi: 10.1177/0741932512448253
- Wei, X., Blackorby, J., & Schiller, E. (2011). Growth in reading achievement in a national sample of students with disabilities ages 7 to 17. *Exceptional Children*, 78(1), 89-106.
- Lenz, K., Wei, X., & Blackorby, J. (2011). *Evaluation of the effects of the Intel® Reader on improving the reading performance of adolescents with learning disabilities*. Menlo Park, CA: SRI International.
- Blackorby, J., Schiller, E., Mallik, S., Hebbeler, K., Huang, T., Javitz, H., Marder, C., Nagle, K., Shaver, D., Wagner, M., & Williamson, C. (2010). *Patterns in the identification of and outcomes for children and youth with disabilities*. Menlo Park, CA: SRI International.
- Cameto, R., Knokey, A.-M., Nagle, K., Sanford, C., Blackorby, J., Sinclair, B., & Riley, D. (2009). *National profile on alternate assessments based on alternate achievement standards*. A report from the National Study on Alternate Assessments (NCSEER 2009-3014). Menlo Park, CA: SRI International.
- Sanford, C., Levine, P., & Blackorby, J. (2008). *A national profile of the classroom experiences and academic performance of students with learning disabilities: A special topic report from the Special Education Elementary Longitudinal Study (SEELS)*. Menlo Park, CA: SRI International.
- Blackorby, J., Wagner, M., Sumi, C., Marder, C., Cameto, R., Radbill, L., Levine, P., & Newman, L. (2007). *Factors related to academic and social outcomes among elementary and middle school students with disabilities*. Menlo Park, CA: SRI International.
- Blackorby, J., & Knokey, A.-M. (2007). *Students with learning disabilities: A special topic report from the Special Education Elementary Longitudinal Study*. Menlo Park, CA: SRI International.
- Blackorby, J., Knokey, A.-M., Wagner, M., Levine, P., Schiller, E., & Sumi, C. (2007). *What makes a difference? Influences on outcomes for students with disabilities*. Menlo Park, CA: SRI International.
- Cameto, R., Sanford, C., & Blackorby, J. (2007). *Alternate assessment results for students with disabilities in elementary and middle school: A special topic report from the Special Education Elementary Longitudinal Study*. Menlo Park, CA: SRI International.
- Blackorby, J., Wagner, M., Cameto, R., Davies, E., Levine, P., Newman, L., Marder, C., & Sumi, C. (with Chorost, M., Garza, N., & Guzman, A. M.). (2006). *Engagement, academics, social adjustment, and independence: The achievements of elementary and middle school students with disabilities*. Menlo Park, CA: SRI International.

- Blackorby, J., & Knokey, A. M. (2006). *A national profile of students with hearing impairments in elementary and middle school: A special topic report from the Special Education Elementary Longitudinal Study (SEELS)*. Menlo Park, CA: SRI International.
- Blackorby, J., Wagner, M., Marder, C., Cameto, R., Levine, P., Chorost, M., & Guzman, A-M. (2004). *Inside the classroom: The language arts classroom experiences of elementary and middle school students with disabilities*. Menlo Park, CA: SRI International.
- Blackorby, J., & Wagner, M. (2004). *Overview of findings from wave 1 of the Special Education Elementary Longitudinal Study*. Menlo Park, CA: SRI International.
- Blackorby, J., & Cadwallader, T. (2002). Social adaptation and problem behaviors among elementary and middle school students with disabilities. In *Twenty-second annual report to Congress*. Washington, DC: U.S. Department of Education.
- Wagner, M., Blackorby, J., Levine, P., Marder, C., Newman, L., Cardoso, D., & Garza, N. (2002). *Going to school: The characteristics of schools attended by elementary and middle school students with disabilities*. Menlo Park, CA: SRI International.
- Blackorby, J., Wagner, M., Cadwallader, T., Cameto, R., Levine, P., Marder, C., & Giacalone, P. (2002). *Behind the label: The functional implications of disability*. Menlo Park, CA: SRI International.
- Blackorby, J., & Wagner, M. (2001). Parent involvement in the education of students with disabilities in elementary and middle school. In *Twenty-first annual report to Congress*. Washington, DC: U.S. Department of Education.
- Blackorby, J., & Wagner, M. (1998). *Special Education Elementary Longitudinal Study: What stakeholders want and need to know*. Menlo Park, CA: SRI International.
- Blackorby, J., & Cameto, R. (1997). National Science Foundation's study of persons with disabilities in science, math, engineering, and technology. Menlo Park, CA: SRI International.
- Blackorby, J., & Wagner, M. (1997). The employment outcomes of youth with learning disabilities: A review of findings from the NLTS. In P. Gerber & D. Brown, *Learning disabilities and employment*. Austin, TX: PRO-ED.
- Lichtenstein, S., & Blackorby, J. (1995). Who drops out and what happens to them? *Journal of Vocational Special Needs Education*, 18(1), 6-12.

#### **SELECTED PRESENTATIONS**

- Blackorby, J. (2016, April). *Big Data and the Changing World of Special Education*. Paper presented at the CEC Convention, St. Louis, MO.
- Blackorby, J. (2016, April). *STEM and Persons with Disabilities: What do we know and what do we need to know?* Paper presented at the annual meeting of the American Education Research Association, Washington, DC.
- Boardman, A., & Blackorby, J. (2016, February). *Collaborative Strategic Reading at Scale: False Hope*. Paper presented at the annual Pacific Coast Research Conference, San Diego, CA.
- Blackorby, J. (2016, January). *STEM and Persons with Disabilities: What do we know and what do we need to know?* Paper presented at the annual meeting of the American Education Research Association Special Conference, Santa Barbara, CA.
- Blackorby, J. (2015, November). *Unconditional Education – An I3 Innovation Project*. Paper presented at the annual meeting of the American Evaluation Association, Chicago, IL.

- Blackorby, J. (2015, May). *Growth Models: A Primer for States*. Paper presented at the IDC Interactive Institute, Chicago, IL.
- Blackorby, J. (2015, April). *Come one, Come all: Town Hall of Emerging Technologies and Students with Disabilities*. Paper presented at the CEC Convention, Philadelphia, PA.
- Blackorby, J. (2015, February). *Growth Models: A Primer for States*. Paper presented at the IDC Interactive Institute, Albuquerque, NM.
- Blackorby, J. (2014, May). *National Studies on Children and Youth with Disabilities: Major Findings and Policy Implications*. Paper presented to SNELS conference, Chung Yuan Christian University, Taoyuan City, Taiwan.
- Blackorby, J. (2014, May). *Implementation of alternate assessment systems for students with significant cognitive disabilities in the US*. Paper presented to SNELS conference, Chung Yuan Christian University, Taoyuan City, Taiwan.
- Blackorby, J. (2014, April). *National data on students with autism spectrum disorder: What's available? What's possible?* Paper presented at the CEC Convention, Philadelphia, PA.
- Blackorby, J., & Yu, J. (2014, February). *High school math and science preparation and postsecondary STEM pathways for students with an autism spectrum disorder*. Paper presented at the Capacity Building Institute, Seattle, WA.
- Blackorby, J. (2013, November). *Measuring implementation fidelity: CSR Colorado*. Paper presented at the APPAM Conference, Washington, DC.
- Wei, X., Blackorby, J., & Schiller, E. (2010, April). *Growth in reading achievement in a national sample of students with disabilities ages 7 to 17*. Paper presented at the American Educational Research Association Annual Conference, Denver, CO.
- Wei, X., Blackorby, J., & Lenz, K. (2010, April). *Growth curve analysis of math achievement in students in 11 disabilities categories, ages 7 to 17*. Paper presented at the American Educational Research Association Annual Conference, Denver, CO.
- Blackorby, J., & Schiller, E. (2007, April). *Defining proficiency: An examination of cut scores, student and program characteristics among a national sample of students with learning disabilities*. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.
- Blackorby, J. (2006, August). *A look at low-achieving students in special education*. Paper presented at the annual project director's meeting of the Office of Special Education Programs, Washington, DC.

# Russell Swinburne Romine

Associate Director of Test Development and Production,  
DLM<sup>®</sup> Alternate Assessment

Center for Educational Testing and Evaluation, The University of Kansas  
1122 West Campus Road · Lawrence, Kansas 66045  
(785) 864-5245 · rsr@ku.edu

## EDUCATION

University of Minnesota, *Minneapolis, Minnesota*  
Educational Psychology, Ph.D.

2013

Thesis: "The Effects of Causal Relations and Propositional Density in Texts on Item Difficulty in Reading Comprehension Assessment."

Macalester College, *St. Paul, Minnesota*  
Psychology, B.A.

2001

## PUBLICATIONS

Lea, R. B., Rapp, D. N., Elfenbein, A., Mitchel, A. D., & Swinburne Romine, R. (2008). Sweet silent thought: Alliteration and resonance in poetry comprehension. *Psychological Science, 19*, 709-716.

Clark, A., Karvonen, M., & Swinburne Romine, R. (2014). Results from external review during the 2013–2014 academic year (Technical Report No. 14-02). Lawrence, KS: University of Kansas, Center for Educational Testing and Evaluation.

Clark, A., Swinburne Romine, R., Bell, B., & Karvonen, M. (2015). *Results from external review during the 2014–2015 academic year* (Technical Report No. 15-01). Lawrence, KS: University of Kansas, Center for Educational Testing and Evaluation.

## PRESENTATIONS

Thatcher, E. & Swinburne Romine, R. (2016, June) Re-Examining Fairness: Findings from Dynamic Learning Maps Alternate Assessment Design and Implementation. Presentation at the National Conference on Student Assessment, Philadelphia, PA.

Swinburne Romine, R., Karvonen, M., Shipman, M. (2016, April). *Validity Evidence for a Writing Assessment for Students with Significant Cognitive Disabilities*. Electronic board session presented at the annual meeting of the National Council on Measurement in Education, Washington, D.C.

Swinburne Romine, R., Shipman, M. (2016, April). *Instructionally Relevant Large Scale Writing Assessments for Students with Significant Cognitive Disabilities*. Poster session presented at the annual conference of the Council for Exceptional Children, St. Louis, MO.

Swinburne Romine, R., Andersen, L., Nash, B., Shipman, M., Ruhter, R., & Lawrence, A. (2015, October) Test Development in a Learning Maps Environment. Conference Workshop given at the annual meeting of the International Association for Educational Assessment, Lawrence, KS.

Swinburne Romine, R., Clark, A. & Karvonen, M. (2015, April) *Gathering Evidence of Response Processes for Alternate Assessments (AA-AAS)*. Paper presented at the annual meeting of the National Council on Measurement in Education, Chicago, IL.

Broadus, A., Swinburne Romine, R., Lawrence, A., & Shipman, M. (2015, April). *Alternate Assessment for Students who are Blind or Visually Impaired*. Paper presented at the annual conference of the Council for Exceptional Children, San Diego, CA.

Swinburne Romine, R., & Schuster, J. (2014, April). *Moving beyond learning progressions to dynamic learning maps: A validation study of a Dynamic Learning Map English Language Arts section*. Paper presented at the annual meeting of the American Educational Research Association, Philadelphia, PA.

## **RESEARCH AND TEST DEVELOPMENT EXPERIENCE**

*Associate Director of Test Development and Production*  
*Dynamic Learning Maps Alternate Assessment Consortium*

*Center for Educational Testing and Evaluation, University of Kansas* 2015-Present

I oversee test development and production for DLM and am a member of the project leadership team. I oversee over 20 full and part time staff members responsible for design and delivery of DLM assessments that are used for accountability in 15 states. I contribute to accessibility and validity research for the assessment system.

*English Language Arts Research Lead*

*Center for Educational Testing and Evaluation, University of Kansas*

2013-2015

I led the English language arts (ELA) test development team for the Dynamic Learning Maps Alternate Assessment. I supervised ELA content staff and oversaw development of texts and items for ELA assessments. I conducted research related to the learning maps and investigate methods of validation of the models represented in the learning maps.

*Post-Doctoral Researcher*

*Center for Educational Testing and Evaluation, University of Kansas*

2012-2013

I was a post-doctoral research at the Center for Educational Testing and Evaluation at the University of Kansas. I worked on the Dynamic Learning Maps project in the English Language Arts area.

*Dissertation Research*

*Department of Educational Psychology, University of Minnesota*

2010-2013

My dissertation, "The Effects of Causal Relations and Propositional Density in Texts on Item Difficulty in Reading Comprehension Assessment," examined the relationship between reader-level variables and text-level variables in a large-scale assessment of reading comprehension for Grade 10 students in Minnesota, administered in 2006.

*Research Assistant*

*National Research Center for Career and Technical Education,*  
*University of Minnesota*

2006-2008

I was responsible for data management and analysis for a professional development program for high school math teachers and teachers of career and technical education classes. I analyzed qualitative and quantitative data using a variety of descriptive and basic inferential methods and contributed to formal reports for the Center.

*Research Assistant*

*Department of Educational Psychology, University of Minnesota*

2008

Contributed to an evaluation study comparing the Educational Psychology Department to comparable programs at other research universities.

**PROFESSIONAL EXPERIENCE**

*Facilitator*

*Dynamic Learning Maps Science Alternate Assessment Standard Setting, Kansas City, MO* June, 2016

*Facilitator*

*Dynamic Learning Maps Alternate Assessment Standard Setting, Kansas City, MO* June, 2015

*Facilitator*

*Alaska Measures of Progress Standard Setting, Anchorage, AK* July, 2015

*Facilitator*

*Kansas Assessment Program Standard Setting, Topeka, KS* July, 2015

*Assessment and Instructional Design Consultant*

*Perpich Center for the Arts, Golden Valley, MN* 2012

I contributed to the design an online professional development resource for improving assessment practices for dance educators in Minnesota.

*Consultant*

*Teacher Education Redesign Initiative, University of Minnesota* 2012

I worked with several committees on a redesign initiative to improve teacher education and licensure programs at the University of Minnesota.

**TEACHING EXPERIENCE**

*Instructor - EDHD 5001 - Learning Cognition and Assessment*

*College of Education and Human Development, University of Minnesota,* 2009-2012

I taught both large lecture and small discussion sections of an introductory graduate-level educational psychology course for teacher licensure candidates at the University of Minnesota. The course focused on theories of learning and educational assessment. Topics included theories of learning, descriptive statistics, measures of central tendency, probability, interpreting scores, reliability and validity.

*Instructor - EDHD 5001 - Learning Cognition and Assessment*

*College of Education and Human Development, University of Minnesota,* 2008, 2010, 2012

I taught an introductory educational psychology course in the College of Education and Human Development at the University of Minnesota, Crookston. The course was delivered both online and via a live video link between the Twin Cities campus and campus in Crookston, Minnesota.

*Teaching Assistant - EDHD 5001 - Learning Cognition and Assessment* 2005-2009  
*College of Education and Human Development, University of Minnesota,*

I was a graduate instructor of a discussion section of “*Learning Cognition & Assessment*,” I was responsible for facilitating a discussion session of 24-30 students, grading assignments, writing exams and ensuring that the course aligned with Minnesota State Standards for Teacher Preparation.

*Teaching Assistant - EPSY 8905 - Landmark Issues in Educational Psychology* 2008, 2010  
*Department of Educational Psychology, University of Minnesota,*

I was a teaching Assistant for Dr. Scott McConnell for a Ph.D. level, required seminar which focused on history and research methods in educational psychology.

#### **AWARD**

University of Minnesota Department of Educational Psychology Graduate Student Teaching Award, May, 2010.

# Sue Bechard, Senior Advisor

Center for Educational Testing and Evaluation, The University of Kansas  
1122 West Campus Road · Lawrence, Kansas 66045  
(603) 767-6898 · sue.bechard@ku.edu

## EDUCATION

---

*Ph.D., Social and Multicultural Foundations of Education* 1988  
University of Colorado, Boulder, CO

*M.A., Special Education, Educationally Handicapped* 1979  
University of Northern Colorado

*B.A., Special Education, Emotional Disability* 1971  
Western Michigan University, cum laude

## PROFESSIONAL EXPERIENCE

---

**Work Experience** 2010 – present  
*Senior Advisor*  
Dynamic Learning Maps, The University of Kansas, Lawrence, KS

*Interim Associate Director for Test Development* Nov. 2012 – June 2013  
Dynamic Learning Maps, The University of Kansas, Lawrence, KS 2014-2010

*Director* 2014 - 2010  
Office of Inclusive Educational Assessment, Measured Progress, Dover, NH

*Director* 2000-2004  
Special Education Division, Measured Progress, Dover, NH

*Supervisor* 1991-2000  
Special Education Unit, Colorado Department of Education, Denver, CO

**Research Experience**

Advisor/Task Lead 2010-2015  
*Dynamic Learning Maps Alternate Assessment System Consortium*. University of Kansas, University of North Carolina Chapel Hill, WestEd, and the ARC. General Supervision Enhancement Grant ((CFDA) Number: 84.373X)

Principal Investigator/Project Director 2007-2010  
*Adapting Reading Test Items to Increase Validity of Alternate Assessments Based on Modified Academic Achievement Standards*. Montana Collaborative and Measured Progress. Enhanced Assessment Grant (CFDA Number: 84.368).

Project Director 2007-2010  
*Identifying Students in Need of Modified Achievement Standards and Developing Valid Assessments*. Montana and Measured Progress. General Supervision Enhancement Grant (CFDA 84.373).

Co-PI/Project Director	2007-2010
<i>State Academic Learning Links with Self-Evaluation for Alternate Assessment</i> . Pennsylvania Collaborative, Measured Progress, University of North Carolina Charlotte, Western Carolina University. Enhanced Assessment Grant (CFDA 84.368)	
Technical Advisory Board	2005-2008
<i>Developing Accessible and Valid Reading Assessments: A Research Based Solution</i> . ETS. Office of Special Education Programs, Research on Accessible Reading Assessments (CFDA 84.324F).	
Expert Panel	2006-2007
<i>Oklahoma Modified Alternate Assessment Program</i> . Oklahoma Department of Education and Stanford Research Institute. General Supervision Enhancement Grant (CFDA 84.326X)	
Co-Project Director	2005-2007
<i>Determining the Feasibility of an Alternate Assessment Based on Modified Achievement Standards: A Planning Project and Pilot Test</i> . Montana and Measured Progress, General Supervision Enhancement Grant (CFDA 84.373X – Priority B).	
Collaborating Partner	2004-2007
<i>Reaching ‘Students in the Gap’ through Web-based Task Module Assessments</i> . Rhode Island, New England Compact. Enhanced Assessment Grant (CFDA #84.368)	
Research Study Group/ASES SCASS	2005-2006
<i>Project DAATA: Developing Alternate Assessment Technical Adequacy</i> . West Virginia and Assessing Special Education Students (ASES) SCASS. Enhanced Assessment Grant (CFDA 84.368A)	
Project Leadership Team	2004-2006
<i>Knowing What Students with Significant Cognitive Disabilities Know: Defining and Disseminating Technical Criteria for Alternate Assessments through a Research and Practice Partnership</i> . New Hampshire Collaborative. Enhanced Assessment Instruments Grant (CFDA #84.368)	
Management Team/Component and Activity Director	2003-2005
<i>Designing Alternate Assessments Based on Standards for Educational Test Construction, Evaluation, Documentation, and Fairness</i> . Colorado Alternate Assessment Collaborative. Enhanced Assessment Grant (No. S368A03000).	
<b>Teaching Experience</b>	
<i>Honorarium professor &amp; Special Education Advisory Committee</i>	1988 - 2000
University of Colorado at Denver	
<i>Affiliate faculty</i>	1988 - 2000
Adams State College, Alamosa, CO	
<i>Public School Teacher</i>	1971 - 1991
Elementary, middle, and high school special education	
Subjects: English language arts and mathematics	

## SELECTED PUBLICATIONS

---

Kingston, N.M., Karvonen, M., Bechard, S., & Erickson, K.A. (2016). The philosophical underpinnings and key features of the Dynamic Learning Maps Alternate Assessment. Teachers College

Record (Yearbook), 118(14). Retrieved August 22, 2016 from <http://www.tcrecord.org> ID Number: 221540.

- Anderson, L., Bechard, S., & Merriweather, K. (2016, April). *Equity in science education for students with significant cognitive disabilities through alternate content standards*. Paper presented at the 2016 annual meeting of the National Association for Research in Science Teaching. Baltimore, Maryland.
- Karvonen, M., Bechard, S., & Wells-Moreaux, S. (2015, April). *Accessibility considerations for students with significant cognitive disabilities who take computer-based alternate assessments*. Paper presented at the Annual meeting of the American Educational Research Association, Chicago, IL.
- Bechard, S. (2013, April). *Lessons learned about construct-irrelevant variance (CIV) from a review of AA-MAS research projects*. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, CA.
- Thurlow, M. L., Lazarus, S. S., & Bechard, S. (Eds.). (2013). *Lessons learned in federally funded projects that can improve the instruction and assessment of low performing students with disabilities*. Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes. Available at <http://www.cehd.umn.edu/NCEO/OnlinePubs/LessonsLearned.pdf>
- Bechard, S., Lazarus, S. S., & Thurlow, M. L. (2013). Struggling learners, policies and research on alternate assessments based on modified achievement standards. In Thurlow, M. L., Lazarus, S. S., & Bechard, S. (Eds.). (2013). *Lessons learned in federally funded projects that can improve the instruction and assessment of low performing students with disabilities*. Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes.
- Bechard, S. (2013). Lessons learned about technology enhanced assessments for AA-MAS. In Thurlow, M. L., Lazarus, S. S., & Bechard, S. (Eds.). (2013). *Lessons learned in federally funded projects that can improve the instruction and assessment of low-performing students with disabilities*. Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes.
- Bechard, S., Almond, P., & Cameto, R. (2011). Item and test alterations: Designing and developing alternate assessments with modified achievement standards. In Russell, M. (Ed.). *Assessing students in the margins: Challenges, strategies, and techniques*. Charlotte, NC: Information Age Publishing.
- Ferdous, A. A., Bechard, S., & Buckendahl, C. (2011). Setting performance standards for students with disabilities on alternate assessments. In Bovaird, J.A., Geisinger, K., & Buckendahl, C. (Eds.) *High stakes testing in education: Science and practice in K-12 settings*. Washington, DC: APA Books.
- Bechard, S., Sheinker, J., Abell, R., Barton, K., Burling, K., Camacho, C., Cameto, & Tucker, B. (2010). *Measuring Cognition of Students with Disabilities Using Technology-Enabled Assessments: Recommendations for a Research Agenda*. Dover, NH: Measured Progress, and Menlo Park, CA: SRI International.
- Wakeman, S., Bechard, S., Karvonen, M., & Almond, P. (2009). *Principles for aligning alternate assessment based upon alternate academic achievement standards with grade level academic content standard: A self-study guide for educators*. Dover New Hampshire: Measured Progress. Available at [www.measuredprogress.org](http://www.measuredprogress.org).
- Bechard, S., Russell, M., Camacho, C., Thurlow, M., Ketterlin Geller, L., Godin, K., McDivitt, P., & Hess, K. (2009). *Improving Reading Measurement for Alternate Assessment: Suggestions for Designing Research on Item and Test Alterations*. Measured Progress: Dover, NH and SRI International, Arlington, VA.

## SELECTED PRESENTATIONS

---

- Anderson, L., Bechard, S., & Ruhter, L. (2016, April). *Implications of New Science Frameworks for Alternate Standards, Instruction, and Assessment*. Council for Exceptional Children 2016 Convention & Expo: St. Louis, MO.
- Bechard, S., Sato, E., Almond, P., Heritage, M., Dean, V. J., Warren, S., & Weigert, S. (2013, June). *Special populations, comprehensive Next-Generation assessment systems, and learning models: Transition to assessment for learning*. CCSSO National Conference on Student Assessment, National Harbor, MD.
- Bechard, S., Lazarus, S., Loving-Ryder, S., Dean, V., Chia, M., Reavis, T., & Thurlow, M. (2013, April). *The tests may go, but the kids will stay: What do Nextgen assessment developers need to learn from research on AA-MAS?* National Council on Measurement in Education, San Francisco, CA.
- Bechard, S., Almond, P., Sato, E., Hess, K., Cameto, R., & Kopriva, R. (2012, June). *Learning progressions and learning maps: Access to CCSS for special population students*. CCSSO National Conference on Student Assessment, Minneapolis, MN.
- Bechard, S., Kettler, R., Kloo, A., Loving-Ryder, S., & Stoica, W. (2011, June). *Item accessibility for the next generation of assessments: Lessons learned from development of AA-MAS* (June, 2011). CCSSO National Conference on Student Assessment, Orlando, FL.
- Bechard, S., & Almond, P. (2011, April). *Technology-enabled assessments, students with disabilities, and Universal Design: agendas for research* Annual meeting of the American Educational Research Association, New Orleans, LA.
- Bechard, S., Cameto, R., Clarke-Midura, J., Russell, M., Higgins, J., Johnstone, C., Almond, P., & Fedorchak, G. (2010, June). *Technology-enabled assessments: Examining the potential for universal access and better measurement of achievement*. Annual meeting of the National Council on Measurement in Education, Detroit, MI.
- Bechard, S., Parker, C., Snow, J., Hock, M., & Gallagher, C. (2010, June). *Reducing cognitive load in 2% assessments: What works (or doesn't work) for eligible students?* CCSSO National Conference on Student Assessment, Detroit, MI.
- Bechard, S., Almond, P., Wakeman, S., Turner, C., & Abel, R. (2010, May). *Content validity: Alignment to grade-level content standards in alternate assessment judged against alternate achievement standards*. Annual meeting of the American Educational Research Association, Denver, CO
- Bechard, S., Gorin, J., Parker, C., McDivitt, P., Stoica, W., & Rabinowitz, S. (2010, May). *Research methodologies and theoretical foundations to support alternate assessment based on modified achievement standards (AA-MAS)*. Annual meeting of the National Council on Measurement in Education, Denver, CO.
- Bechard, S., Almond, P., Turner, C., & Bowen, T. (2010, February). *State academic learning links with self-evaluation for alternate assessment (based on alternate achievement standards)*. Combined meeting of the ASES/TILSA SCASS, Council of Chief State School Officers, Atlanta, GA.
- Bechard, S., Almond, P., Karvonen, M., Wakeman, S., Bowen, T., Turner, L., Turner, C., & Herrera. (2009, June). *Hitting a moving target: A discussion of ten alignment studies for AA-AAS*. National Conference on Student Assessment, Los Angeles, CA.
- Bechard, S., Nedley, S., & Taylor, C. (2008, June). *Hints and tips for addressing alternate assessment alignment issues for peer review*. (National Conference on Student Assessment: Orlando, FL.

- Bechard, S., Wiener, D., Glass, J., Farley, D., & Fedorchak, G. (2006, June). *Mining the data in alternate assessments to improve our knowledge of what students know*. Presentation at the 36th National Conference on Large-Scale Assessment, San Francisco, CA.
- Bechard, S. & Almond, P. (2005, July). *Developing alternate assessments meaningfully aligned to academic standards for students with significant disabilities*. Paper presented at the China-US International Education Conference, Beijing, People's Republic of China.
- Bechard, S., Almond, P., Filbin, J. Tindal, G., & Hall, T. (2005, June). *Alignment of alternate assessments to standards using consensus frameworks and expanded benchmarks*. Presentation at the 35th Annual National Conference on Large-Scale Assessment, San Antonio, TX.
- Bechard, S. (2005, April). *Designing alternate assessments based on states' standards, expanded benchmarks, and universal design*. Paper presented at the National Council on Measurement in Education. Montreal, Canada.
- Bechard, S., Cahalan-Laitusis, C., Tindal, G., Cook, L., Morgan, D., Thurlow, M., & Roeber, E. (2004, June). *Approaching the validation of alternate assessments: A Research framework and examples from states*. 34th Annual National Conference on Large-Scale Assessment, Boston, MA.

## SELECTED PROFESSIONAL SERVICE

---

<i>Invited Expert</i> CCSSO Students with Disabilities Assessment Advisory Task Force, Washington, DC.	2013- present
<i>Co-Facilitator, Organizer</i> Invitational Research Symposium. Students with disabilities and within year assessments as part of a comprehensive assessment system. SRI International, Arlington, VA.	2013
<i>Consultant, Co-Organizer</i> Colloquium on Learning Models, Instruction, and Next Generation Assessments that Include Special Populations. WestEd., Washington, D.C.	2012
<i>Project Manager, Co-Editor</i> White Paper. Lessons learned in federally-funded projects that can improve the instruction and assessment of low performing students with disabilities. National Center on Educational Outcomes, Multi-State General Supervision Enhancement Grant, Minneapolis, MN.	2012
<i>Co-Facilitator and Organizer</i> Invitational Research Symposium. Understanding learning progressions and learning maps to inform the development of assessment for students in special populations. SRI International, Arlington, VA.	2011
<i>Vice Chair/Chair</i> American Educational Research Association Special Interest Group on Inclusion and Accommodations in Large-Scale Assessments	2008 – 2010



Andersen, L., & Ward, T. J. (2013). An expectancy-value model for the STEM persistence of ninth grade underrepresented minority students. In J. L. Wood and R. T. Palmer (Eds.), *Examining the role of community colleges in STEM production: A focus on underrepresented racial and ethnic minorities* (pp. 59-74). New York, NY: Routledge.

Andersen, L., & Cross, T. L. (2011). Suicide and the gifted adolescent: Advice for counselors, In J. R. Cross and T. L. Cross (Eds.), *Handbook for school counselors serving gifted students* (pp. 631-648). Waco, TX: Prufrock.

### **Journal Articles**

Andersen, L., & Nash, B. (2016). Making science accessible to students with significant cognitive disabilities. *Journal of Science Education for Students with Disabilities*, 19, 1. <http://scholarworks.rit.edu/jsesd/vol19/iss1/3/>

Bean, N., Gnadt, A., Maupin, N., White, S., & Andersen, L. (2016). Mind the gap: Using secondary data to explore disparities in STEM education. *Prairie Journal of Education Research*, 1, 1. <http://newprairiepress.org/pjer/vol1/iss1/7/>

Andersen, L., & Chen, J. A. (2016). Do high ability students disidentify with science? *Science Education*, 100, 1, 57-77. doi: 10.1002/sc.21197

Zacharakis, J., Wang, H., Patterson, M., & Andersen, L. (2015). Using modern statistical methods to analyze demographics of ABE/GED students who transition to a community or technical college programs. *Journal of Research and Practice for Adult Literacy, Secondary, and Basic Education*, 4, 3, 5-21.

Andersen, L., & Cross, T. L. (2014). Are students who have high ability in math more motivated in math and science? *Roeper Review*, 36, 221-234. doi: 10.1080/02783193.2014.945221

Andersen, L. (2014). Visual-spatial ability: Important to STEM, ignored in gifted education. *Roeper Review*, 36, 114-121. doi: 10.1080/02783193.2014.884198

Andersen, L., & Ward, T. J. (2014). Expectancy-value models for the STEM persistence plans of ninth-grade, high-ability students: A comparison between Black, Hispanic, and White students. *Science Education*, 98, 216-242. doi: 10.1002/sc.21092

Andersen, L. (2013, October). Motivating children to develop their science, technology, engineering, and mathematics (STEM) talent. *Parenting for High Potential*, 14-18.

Andersen, L. & Raizedah, B. (2013). Implementing engineering in instructional strategies: The NASA Simulation-Based Engineering and Science Teacher Professional Development Program, *Journal of Virginia Science Education*, 5, 64-71.

Andersen, L. (2012, Summer). Mindsets over subject matter: How our beliefs about intelligence impact STEM talent development. *Teaching for High Potential*, 1.

Andersen, L., & Matkins, J. J. (2011). Web 2.0 tools and the reflections of preservice secondary science teachers. *Journal of Digital Learning in Teacher Education*, 28, 25-36.

Andersen, L. (2011). Podcasts, cognitive theory, and RSS: What is the potential when used together? *Journal of Educational Media and Hypermedia*, 20, 61-76.

## PRESENTATIONS

---

- Andersen, L., & Bechard, S. (2016, April). Equity in science education for students with significant cognitive disabilities through alternate content standards. Paper presented at the 89<sup>th</sup> Annual Convention of the National Association for Research in Science Teaching, Baltimore, MD.
- Andersen, L., Bechard, S., & Ruhter, L., (2016, April). Implications of new science frameworks for alternate standards, instruction, and assessment. Paper presented at the 2016 Annual Convention of the Council for Exceptional Children, St. Louis, MO.
- Andersen, L. (2016, January 8). Making science accessible to student with significant cognitive disabilities. Paper presented at the 23<sup>rd</sup> International Conference of the Association for Science Teacher Education, Reno, NV
- Swinburne Romine, R., Andersen, L., Nash, B., Shipman, M., Ruhter, L., & Lawrence A. (2015, October). Test development in a learning maps environment. Paper presented at the Conference of the International Association for Educational Assessment, Lawrence, KS.
- Andersen, L., & Chen, J. A. (2015, April). Science motivation profiles using latent profile analysis with HSLs: 2009. Paper presented at the 2015 Annual Meeting of the American Educational Research Association, Chicago, IL.
- Andersen, L. (2014, November). Are students who have high ability in math more motivated in math and science? Invited paper presented at the 61st Annual Convention of the National Association for Gifted Children (Dissertation Award – 2nd Place), Baltimore, MD.
- Andersen, L., & Matkins, J. J. (2014, January 16). Developing a community of practice with preservice science teachers using blog-based reflections. Paper presented at the 21<sup>st</sup> International Conference of the Association for Science Teacher Educators, San Antonio, TX.
- Cross, J. R., Ambrose, D., & Andersen, L. (2013, November). Social inequality, gifted education, and Frank Sinatra: Are we avoiding a necessary debate? Paper presented at the 60<sup>th</sup> Annual Convention of the National Association for Gifted Children, Indianapolis, IN.
- Andersen, L. (2012). An expectancy-value model for the STEM persistence of ninth grade, high-ability, underrepresented minority students using National Data. Poster presented at the 59<sup>th</sup> Annual Convention of the National Association for Gifted Children Research & Evaluation Network Graduate Student Research Gala. (Awarded First Place)
- Andersen, L. (2012, November). Diverse, high-ability students and STEM talent development: Why do many opt out? Paper presented at the 59<sup>th</sup> Annual Convention of the National Association for Gifted Children, Denver, CO.
- Andersen, L., & Schmidt, A. M. (2012, November). Nanoscience! Paper presented at the 59<sup>th</sup> Annual Convention of the National Association for Gifted Children, Denver, CO.
- Andersen, L. (2012, March). Student factors that affect STEM talent development: What the National data says and what teachers can do. Paper presented at the 17<sup>th</sup> Annual National Curriculum Network Conference, Williamsburg, VA.

## PROFESSIONAL SERVICE & AFFILIATIONS

---

### Department

- Member, search committee for tenure-eligible faculty in literacy education, (2014)

### Community/Public Schools

- Organized science Olympiad for USD 383 with 30 preservice teachers (2014)

### Profession

- Editorial Board Member, *Journal for Science Teacher Education*, (2014-present)
- Manuscript reviewer, *Developmental Psychology*, (2016 - present)
- Manuscript reviewer, *Journal for the Education of the Gifted*, (2010 - present)
- Manuscript reviewer, *Science Education*, (2013 - present)
- Manuscript reviewer, *Roeper Review*, (2012 - present)
- Manuscript reviewer, *Gifted Child Quarterly*, (2012 - present)
- Proposal reviewer, National Association of Gifted Children, (2011 - 2014)
- Proposal reviewer, National Association for Research in Science Teaching, (2013 - present)

### Dissertation and Thesis Committees

#### Completed Dissertations – Committee Member

*The influence of school factors on teacher efficacy in student engagement.* Curtis Chandler, October 2014.

### Other Affiliations

- American Educational Research Association (2014 - present)
- Council for Exceptional Children (2015 - present)
- Association for Science Teacher Education (2011 - present)
- National Association for Gifted Children (2009 – present)

## PROFESSIONAL DEVELOPMENT

---

- *Fundamentals of R*, (Georgia R Institute, 2012)

## AWARDS

---

- Dissertation Award, 2<sup>nd</sup> Place, National Association for Gifted Children, (2014)
- Doctoral Student Award, National Association for Gifted Children (2013)
- 1<sup>st</sup> Place, Completed Doctoral-Level research, NAGC Research and Evaluation Network Graduate Student Research Gala (2012)
- The Armand J. and Mary Faust Galfo Education Research Fellowship, 2012-13
- National Science Teachers Association, VSP Vision of Science Award (2008)
- National Board Certified Teacher, Adolescent and Young Adult Science (2008)
- Distinguished Teaching Award, Ocean Lakes High School (2004)
- Radio Shack National Teacher Award (2003)

# LINDSAY RUHTER

Science Test Development Coordinator, Dynamic Learning Maps Consortium  
Center for Educational Testing and Evaluation, The University of Kansas  
1122 West Campus Road Lawrence, KS  
lindsay.ruhter@ku.edu

## EDUCATION

*College of William and Mary, Williamsburg, VA*

Master of Arts in Education, August 2006

- Triple endorsement in Learning Disabilities, Emotional Disturbances, and Mental Retardation
- Master's Thesis: *Planning for generalization during phonics instruction: A case study of a child with mental retardation*

*College of William and Mary, Williamsburg, VA*

Bachelor of Arts Degree in Psychology, December 2004, *Magna Cum Laude*

- Awarded Research Grant for Independent Research

## SELECTED PROFESSIONAL EXPERIENCE

### University of Kansas

Test Development Coordinator, Dynamic Learning Maps Consortium, Lawrence, KS (3/15 – Present)

- Coordinated the development and delivery of the Dynamic Learning Maps Consortium alternate assessment in science.
- Used special education expertise to write, review and edit test items to align with particular standards and increased accessibility to test content for students with significant cognitive disabilities.
- Lead five-day item writing workshop with educators from 4 states.
- Developed training materials and presented multiple presentations on item writing and item reviews to test item writers and item reviewers on and off-site.
- Served as an instructor for online course, DLM Science Item Writer Training.
- Wrote and reviewed technical documentation regarding test development processes, including processing data from external reviews, quality control procedures and specific data entry procedures.
- Wrote and reviewed technical documentation for state peer review, including critical elements.
- Conducted test administration observations and participated in cognitive labs in multiple states.
- Presented on test development processes and updates on monthly calls to state governance partners.
- Worked collaboratively with different teams to ensure deliverables were met.

Assistant Test Development Coordinator, Dynamic Learning Maps Consortium, Lawrence, KS (5/13-3/15)

- Worked closely with Test Development Coordinator in all areas of test development, including development of test items, organizing content reviews of test items, organizing data, and making decisions on test items from external reviews and field testing.

- Utilized test development computer software in the areas of test item reviews, and identifying and submitting defect reports and data entry.

### **Virginia Beach City Public Schools**

Special Education Teacher, Virginia Beach Public Schools, Virginia Beach Middle School, Virginia Beach, VA (8/06-2/11)

- Following a thorough review of each child, determined with parents, administrators, and other professionals, appropriate services to address needs and foster success. Evaluated academic and behavioral progress through formal and informal assessments.
- Developed and delivered creative lessons that stimulated student participation and learning.
- Conducted functional behavior analyses and behavior intervention plans to identify causes of challenging behaviors and teach replacement behaviors to address needs in a nonjudgmental, solution-focused manner.
- Prepared students for Virginia state testing, including traditional and alternate assessment (portfolio-based curriculum-based assessments during instruction).
- Effectively managed caseloads; developed and oversaw implementation of services; developed and maintained accurate records and preserved confidentiality.

Assistant Student Activities Coordinator for Virginia Beach Middle School (9/10-2/11)

- Coordinated large-scale after-school programs, including sports tryouts, through collaboration with staff, students, parents, and outside vendors.
- Developed student teamwork, work ethic, leadership skills through after-school sports programs.

Scorer, Virginia Grade Level Alternative Assessment, Virginia Beach Public Schools (5/09)

- Collaborated with small team of educators to score Virginia Grade Level Alternate Assessment (VGLA) portfolios used for accountability purposes.

### **PRESENTATIONS**

- Andersen, L., Bechard, S., & Ruhter, L. *Implications of New Science Frameworks for Alternate Standards, Instruction, and Assessment*. Presentation at the 2016 annual meeting of the Council for Exceptional Children, St. Louis, MO.
- Swinburne Romine, R., Andersen, L., Nash, B., Shipman, M., Ruhter, L., & Lawrence, A. *Test Development in a Learning Maps Environment*. Presentation at the 2015 annual meeting of the International Association for Educational Assessment, Lawrence, KS.
- *Facilitator*, DLM Standard Setting, Kansas City, MO (6/15)
- *Presenter*, Kansas State Department of Education Conference, Wichita, KS (11/13)
- *Guest Speaker*, Course: Assessment for Instructional Design, College of William and Mary School of Education (3/08, 3/09)
- *Virginia Grade Level Alternative Assessment Outcome and Policy Panel*, Virginia Beach Public Schools (8/08)
- *Presenter*, Virginia Grade Level Alternative Assessment Staff Training (11/07)

## **Brooke L. Nash, PhD**

Center for Educational Testing and Evaluation, The University of Kansas

1122 West Campus Road, Lawrence, Kansas 66045

785.864.8191 | bnash@ku.edu

---

### **EDUCATION**

Ph.D. Psychology and Research in Education: Research, Evaluation, Measurement & Statistics (REMS). University of Kansas, Lawrence, KS. 2012

Dissertation Title: *Technology Enhanced Assessments: An Investigation of Scoring Methods for Scaffolded Item Types*

M.S.Ed. in Psychology and Research in Education: Research, Evaluation, Measurement & Statistics (REMS). University of Kansas, Lawrence, KS. 2008

Thesis Title: *Perceptions and Use of a Formative Assessment System*

B.A. in Psychology and Philosophy. University of Iowa, Iowa City, IA. 2004

---

### **PROFESSIONAL EXPERIENCE**

#### **Center for Education Testing and Evaluation**

*Psychometrician Senior*

2014 – present

Currently serve as the senior level psychometrician and previously served as interim project lead for the Dynamic Learning Maps (DLM) Science alternate assessment project. Co-lead the psychometric work for the DLM English language arts and mathematics assessment projects.

#### **Ascend Learning**

*Lead Psychometrician*

2013 – 2014

Co-led the project planning and management of psychometric work tasks for five large-scale assessments in the healthcare industry including test blueprint development, item review, preliminary and final item analyses, beta testing, equating, and standard setting.

*Psychometrician*

2012 – 2013

Led and conducted operational psychometric work for five large-scale assessments as well as several smaller-scale curriculum support products including a computer-based simulation assessment.

*Researcher*

2010 – 2012

Conducted research on assessment products (both achievement based and certification exams) for the purposes of client distribution, market claims and to help inform product development and improvement initiatives.

**Assessment Technologies Institute***Psychometric Intern & Consultant*

2008 – 2009

- Served as the psychometrician item review meetings which involved interpreting and conveying statistical properties of test items to content specialists. Provided general critique and suggestions in the item review process from a measurement perspective. Also, assisted with beta testing procedures to ensure correctness and accuracy of score reports.

**Center for Educational Testing and Evaluation***Research Assistant*

2006 – 2010

Assisted with the Kansas State Assessment system and the quality control process associated with maintaining the operational functioning of the General Kansas State Assessments, Kansas Assessments of Modified Measures (KAMM), Kansas Alternate Assessments (KAA), Formative Assessments, Interim Assessments, and the Kansas English Language Proficiency Assessments (KELPA).

---

**CONFERENCE PRESENTATIONS**

- Nash, B. & Thompson, W.J (2016). Evaluating an Initialization Tool for Student Placement into a Map-Based Assessment. Proposal submitted to the National Council on Measurement in Education, San Antonio, TX.
- Clark, A., Karvonen, M., Swinburne Romine, R. & Nash, B. (2016). Exploring Teacher Choice When Using an Instructionally Embedded Alternate Assessment System. Proposal submitted to the National Council on Measurement in Education, San Antonio, TX.
- Romine, R., Andersen, L., Nash, B., Shipman, M., Ruhter, R., & Lawrence, A. (2015). Test development in a learning maps environment. Workshop presented at the annual meeting of the International Association for Educational Assessment, Lawrence, KS.
- Becker, G., Weiner, J. & Nash, B. (2014). The Service Differentiator as a Marketplace Innovation. Presented at the Association of Test Publishers, Scottsdale, AZ.
- Juve, T. & Nash, B. (2014). Interpreting Test Scores and Establishing Proficiency Levels. Presented at the ATI Nurse Educator Summit, Orlando, FL.
- Dunham, M., McKee, J. & Nash, B. (2012). Current Trends in Nursing Research. Presented at the ATI Nurse Educator Summit, Scottsdale, AZ.
- Shaftel, J., & Nash, B., & Gillmor, S. (2012). Effects of the number of response categories on rating scales. Paper presented at the annual meeting of the American Educational Research Association, Vancouver, Canada.
- Shaftel, J. & Nash, B. (2010). One State's Experience Implementing Links for Academic Learning. Paper presented at the annual meeting of the American Evaluation Association, San Antonio, TX.
- Kingston, N.M. & Nash, B. (2009). The Efficacy of Formative Assessment: A Meta-Analysis. Paper presented at the American Educational Research Association, San Diego, CA.
-

## **PUBLICATIONS AND REPORTS**

### ***Journal Articles***

- Andersen, L. & Nash, B. (2016). Making Science Accessible to Students with Significant Cognitive Disabilities. *Journal of Science Education for Students with Disabilities*: Vol. 19: Iss. 1, Article 3.
- Kingston, N.M. & Nash, B. (2012). How many formative assessment angels can dance on the head of a meta-analytic head. *Educational Measurement: Issues & Practice*, 31(4), pages 18-19.
- Kingston, N.M. & Nash, B. (2011). Formative assessment: a meta-analysis and a call for research. *Educational Measurement: Issues & Practice*, 30(4), pages 28-37.

### ***Encyclopedia Articles***

- Poggio, J. & Nash, B. (2009). Test Development. In B. Kerr (Ed.) *Encyclopedia of Giftedness, Creativity, and Talent*. Thousand Oaks, CA: Sage Publishing.

### ***Technical Reports***

- Nash, B. & Bechard, S. (2016). *Summary of the Science Dynamic Learning Maps™ Alternate Assessment Development Process* (Technical Report No. 16-02). Lawrence, KS: University of Kansas, Center for Educational Testing and Evaluation.
- Karvonen, M., Clark, A. K., & Nash, B. (2015). *2015 Year-end model standard setting: English language arts and mathematics*. Technical Report for Dynamic Learning Maps, Lawrence, KS.
- Karvonen, M., Clark, A. K., & Nash, B. (2015). *2015 Integrated model standard setting: English language arts and mathematics*. Technical Report for Dynamic Learning Maps, Lawrence, KS.
- Nash, B., Clark, A. K., & Karvonen, M. (2015). *First contact: A census report on the characteristics of students eligible to take alternate assessments*. Technical Report for Dynamic Learning Maps, Lawrence, KS.
- Nash, B. (2012). *Technical Manual for the RN Comprehensive Predictor 2010 Forms A and B*. Assessment Technologies Institute, LLC: Leawood, KS.
- Shaftel, J., & Nash, B. (2010). *Kansas Alternate Assessment Alignment Study: Links for Academic Learning*. Technical Report to Kansas State Department of Education: Topeka, KS.

---

## **COMPUTER SKILLS**

Proficient: SPSS, Microsoft Applications (Word, Excel, Powerpoint), Winsteps, ITEMAN, Scoright, Bilog, Multilog, LISERL  
Developing: SQL, VBA, R, Fortran

---

# Amy K. Clark

1122 West Campus Road, Rm. 437 · Lawrence, KS 66045  
(785) 864-8116 · akclark@ku.edu

---

## EDUCATION

---

*Doctor of Philosophy in Educational Psychology and Research:* 2013  
*Research, Evaluation, Measurement, and Statistics*  
Minor: Curriculum Studies  
University of Kansas

*Master of Science in Educational Psychology and Research:* 2011  
*Research, Evaluation, Measurement, and Statistics*  
University of Kansas

*Bachelor of Arts in Elementary Education* 2008  
Wichita State University  
Summa Cum Laude

---

## PROFESSIONAL EXPERIENCE

---

**Psychometrician** 2013 – 2016  
*Dynamic Learning Maps Alternate Assessment Consortium*  
*Center for Educational Testing and Evaluation, The University of Kansas*

**Psychometric Contractor** 2011 – 2015  
*Ascend Learning*

**Independent Consultant** 2012 – 2015  
*Math-Science Partnership Grant, Green River Regional Educational Cooperative*

**Research Fellowship** 2012 – 2013  
*The College Board*

**Graduate Research Assistant** 2010 – 2013  
*Center for Educational Testing and Evaluation, The University of Kansas*

**Intern** 2013  
*National Center for the Improvement of Educational Assessment*

**Research Appointment** 2013  
*National Conference of Bar Examiners*

**Research and Development Intern** 2012  
*MetaMetrics, Inc.*

---

**SELECTED TEACHING EXPERIENCE**


---

<i>Assistant Instructor</i>	2012
PRE 725 Educational Measurement, The University of Kansas	
<i>Lab Assistant</i>	2011
PRE 725 Educational Measurement, The University of Kansas	
<i>Second Grade Teacher</i>	2008 - 2010
Jefferson Elementary, Wichita Public Schools	

---

**PUBLICATIONS**


---

- Clark, A. K.** (2018). Minimum competency testing. In B. Frey, J. Lohmeier, J. Templin, R. Woodland, N. Kingston, & W. Skorupski (eds.) *The SAGE Encyclopedia of Educational Research, Measurement, and Evaluation*. New York: SAGE Publications.
- Kopriva, R., Thurlow, M. L., Perie, M., Lazarus, S. L. & **Clark, A.** (2016). Test takers and the validity of score interpretations. *Educational Psychologist, 51*(1), 108-128. doi: 10.1080/00461520.2016.1158111
- Clark, A. K.,** & Whetstone, P. (2014). The impact of an online mathematics tutoring program on math achievement. *The Journal of Educational Research, 107*(6), 462 – 466. doi: 10.1080/00220671.2013.833075
- Whetstone, P., **Clark, A. K.,** Wheeler Flake, M. (2014). Teacher perceptions of an online tutoring program for elementary mathematics. *Educational Media International, 51*(1), 79-90. doi: 10.1080/09523987.2013.863552
- Kingston, N. M., & **Clark, A. K.** (eds.). (2014). *Test fraud: Statistical detection and methodology*. New York: Routledge.
- Clark, A. K.** & Kingston, N. M. (2014). A brief history of research on test fraud detection and prevention. In N. M. Kingston & **A. K. Clark** (eds.). *Test fraud: Statistical detection and methodology* (pp. 4-7). New York: Routledge.
- Kingston, N. M., & **Clark, A. K.** (2014). Introduction. In N. M. Kingston & **A. K. Clark** (eds.). *Test fraud: Statistical detection and methodology* (pp. 1-3). New York: Routledge.
- Clark, A. K.** (2014). *Validation of a cognitive diagnostic model*. Germany: Scholars Press. ISBN 978-3-639-66161-3
- 

**TECHNICAL REPORTS**


---

- Clark, A.,** Karvonen, M., & Wells-Moreaux, S. (2016). *Summary of results from the 2014 and 2015 field test administrations of the Dynamic Learning Maps™ alternate assessment system* (Technical Report No. 15-04). Lawrence, KS: University of Kansas, Center for Educational Testing and Evaluation.
- Nash, B., **Clark, A. K.,** & Karvonen, M. (2015). *First contact: A census report on the characteristics of students eligible to take alternate assessments* (Technical Report No. 16-01). Lawrence, KS: University of Kansas, Center for Educational Testing and Evaluation.
- Karvonen, M., **Clark, A.,** & Nash, B. (2015). *2015 year-end model standard setting: English language arts and mathematics* (Technical Report No. 15-03). Lawrence, KS: University of Kansas, Center for Educational Testing and Evaluation.

- Karvonen, M., **Clark, A.**, & Nash, B. (2015). *2015 integrated model standard setting: English language arts and mathematics* (Technical Report No. 15-02). Lawrence, KS: University of Kansas, Center for Educational Testing and Evaluation.
- Clark, A.**, Karvonen, M., Swinburne Romine, R., & Bell, B. (2015). *Results from external review during the 2014-2015 academic year* (Technical Report No. 15-01). Lawrence, KS: University of Kansas, Center for Educational Testing and Evaluation.
- Clark, A.**, Karvonen, M., & Swinburne Romine, R. (2014). *Results from external review during the 2013-2014 academic year* (Technical Report No. 14-02). Lawrence, KS: University of Kansas, Center for Educational Testing and Evaluation.
- Clark, A.**, Kingston, N., Templin, J., & Pardos, Z. (2014). *Summary of results from the fall 2013 pilot administration of the Dynamic Learning Maps™ Alternate Assessment System* (Technical Report No. 14-01). Lawrence, KS: University of Kansas, Center for Educational Testing and Evaluation.
- Irwin, P. M., Kingston, N. M., Skorupski, W. P., **Clark, A. K.**, Glasnapp, D. R., & Poggio, J. P. (2009). *Technical manual for the Kansas assessments in history and government*. Lawrence, KS: University of Kansas, Center for Educational Testing and Evaluation.

---

#### NATIONAL PRESENTATIONS

---

- Swinburne Romine, R., Karvonen, M., & **Clark, A. K.** (2016, April). *Validity evidence to support alternate assessment score uses: Fidelity and response processes*. Paper presented at the annual meeting of the National Council on Measurement in Education, Washington, D.C.
- Karvonen, M., **Clark, A. K.**, & Kingston, N. (2016, April). Designing alternate assessment score reports: Implications for instructional planning. In P. Kannan (Chair) *Thinking about your audience in designing and evaluating score reports*. Symposium presented at the annual meeting of the National Council on Measurement in Education, Washington, D.C.
- Swinburne Romine, R., Karvonen, M., & **Clark, A. K.** (2015, April). *Gathering evidence of response processes for alternate assessments (AA-AAS)*. Paper presented at the annual meeting of the National Council on Measurement in Education, Chicago, IL.
- Clark, A. K.**, Templin, J., Bradshaw, L., & Kingston, N. (2015, April). *Psychometrics in a learning maps environment*. Symposium presented at the annual meeting of the National Council on Measurement in Education, Chicago, IL.
- Chen, F., **Clark, A. K.**, & Swinburne Romine, R. (2015, April). *Analysis of learning map structure for a dynamic assessment*. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.
- Clark, A. K.**, Karvonen, M., Kingston, N., Anderson, G., & Wells-Moreaux, S. (2015, April). *Designing alternate assessment score reports that maximize instructional impact*. Paper presented at the annual meeting of the National Council on Measurement in Education, Chicago, IL.
- Whetstone, P. J., **Clark, A. K.**, Joannou Lyon, K., & Bladford, J. (2015, March). *Challenges of college for a student with significant disabilities*. Paper presented at the annual meeting of the American Council on Rural Special Education, New Orleans, LA.
- Karvonen, M. & **Clark, A. K.** (2014, June). *Computer-based testing for students with significant cognitive disabilities: Challenges and opportunities in the next generation*. Presentation at the meeting of the National Conference on Student Assessment, New Orleans, LA.

- Clark, A. K.** & Kingston, N. M. (2014, April). *Comparison of attribute coding procedures for retrofitting cognitive diagnostic models*. Poster presented at the annual meeting of the American Educational Research Association, Philadelphia, PA.
- Clark, A. K.** (2014, April). *Parameter drift methodology and operational testing application*. Poster presented at the annual meeting of the National Council on Measurement in Education, Philadelphia, PA.
- Marion, S. & **Clark, A. K.** (2014, April). Common assignment study: A theory of action. In C. Vignola (Chair) *Tools to support the Common Core State Standards: Implementation, impact and next steps for the Literacy Design Collaborative*. Symposium presented at the annual meeting of the American Educational Research Association, Philadelphia, PA.
- Ferster, A. E., Zhao, F., & **Clark, A. K.** (2014, April). *Understanding the academic profiles of students participating in the AA-AAS: A cluster analysis*. Paper presented at the annual meeting of the American Educational Research Association, Philadelphia, PA.
- Chen, F. & **Clark, A. K.** (2014, April). *Exploration of subgroup equating invariance on elementary reading assessments*. Paper presented at the annual meeting of the National Council on Measurement in Education, Philadelphia, PA.
- Clark, A. K.**, & Kingston, N. M. (2013, April). *Validation of a cognitive diagnostic model of reading comprehension*. Paper presented at the annual meeting of the National Council of Measurement on Education, San Francisco, CA.
- Clark, A. K.**, & Kingston, N. M. (2013, April). *The effect of item ordering on examinee performance: A synthesis of 60 years of research*. Paper presented at the annual meeting of the National Council on Measurement in Education, San Francisco, CA.
- Clark, A. K.**, & Kingston, N. M. (2013, April). *The impact of poverty on English language proficiency assessment performance*. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.
- Bowen, K., & **Clark, A. K.** (2013, April). Predicting text complexity when students read orally for fluency and recall for comprehension. In E. Hiebert (Chair) *Beginning-reader text complexity: Scale development and best-predictor text characteristics*. Symposium presented at the annual meeting of the American Educational Research Association, San Francisco, CA.
- Clark, A. K.** & Kingston, N. M. (2013, April). *Understanding the meaning of slippage and guessing parameters in cognitive diagnostic models*. Poster presented at the annual meeting of the American Educational Research Association, San Francisco, CA.
- Schuster, J. G., **Clark, A. K.**, Mark, C., & Shin, S. (2012, October). *Creating the Dynamic Learning Map: Representing how concepts influence language development*. Poster presented at the Mental Lexicon Conference, Montreal, Canada.
- Clark, A. K.**, & Kingston, N. M. (2012, August). *Identifying sources of differential item functioning on an English language proficiency assessment*. Poster presented at the annual meeting of the American Psychological Association, Orlando, FL.
- Kingston, N. M. & **Clark, A. K.** (2012, April). Instructionally relevant item types. In M. Thurlow & A. Sheinker (Chairs), *The future of alternate assessment: Preliminary directions and findings of the two common core based alternate assessment consortia*. Structured demonstration session conducted at the meeting of the National Council on Measurement in Education, Vancouver, B.C.

Schuster, J. G., **Clark, A. K.**, Mark, C. A., & Shin, S. (2012, April). *Multiple pathways to literacy: The dynamic learning maps alternate assessment system*. Lecture presented at the Council for Exceptional Children Convention and Expo, Denver, CO.

---

#### SELECTED SERVICE

Annual Awards Committee, NCME	2015 – 2017
Membership Committee, AERA Division D: Measurement & Research Methodology	2014 – 2016
Ad Hoc Reviewer, Language Assessment Quarterly	2012 – 2016
Ad Hoc Reviewer, Action in Teacher Education	2013 – 2016
Ad Hoc Reviewer, Computers and Education	2013 – 2016
Reviewer, AERA Division D Graduate Student In-Progress Gala	2014 – 2016
Reviewer, AERA Division D: Psychometrics, Measurement, and Assessment	2015
41 <sup>st</sup> Annual International Association for Educational Assessment Conference Advisory Committee	2013 – 2015
75 <sup>th</sup> Anniversary Celebration Planning Committee, NCME	2012 – 2013
Conference on Statistical Detection of Potential Test Fraud Planning Committee, Center for Educational Testing and Evaluation	2011 – 2012

---

#### AWARDS AND HONORS

Nominee: Outstanding Dissertation for the School of Education, University of Kansas	2014
Doctoral Dissertation received Honors, University of Kansas	2013
Covington Award for Research on Testing, National Conference of Bar Examiners	2013
Research Fellowship Award, College Board	2012 – 2013
Achievement Scholarship, University of Kansas School of Education	2011 – 2013
Nominee: Outstanding Thesis for the School of Education, University of Kansas	2012
Master's Thesis received Honors, University of Kansas	2011

## **MICHELLE L. SHIPMAN**

Test Development Lead  
English Language Arts Test Development Coordinator  
Dynamic Learning Maps  
Center for Educational Testing and Evaluation  
University of Kansas

### **CONTACT INFORMATION**

440 Joseph R. Pearson Hall  
1122 West Campus Road  
Lawrence, KS 66045-3101  
mshipman@ku.edu

3414 SE Walnut Drive  
Topeka, KS 66605  
785-221-9447

### **EDUCATIONAL BACKGROUND**

*Washburn University*, Topeka, Kansas  
B.Ed. Elementary Education, 1991

### **PROFESSIONAL EXPERIENCE**

University of Kansas, Lawrence, Kansas  
*Test Development Lead for Dynamic Learning Maps*  
6/2016-present

- Coordinated the development and delivery of Dynamic Learning Maps alternate assessment forms and specialized alternate assessment.
- Lead test development improvement initiatives in areas including item development, internal and external review, quality assurance, and approval of test content.
- Prepared documentation about test development processes for technical and non-technical audiences.
- Collaborated with team members on grant writing projects and proposals.
- Managed a staff that includes two full-time staff members and their direct reports, including hiring, supervision, professional development, and evaluation responsibilities.

University of Kansas, Lawrence, Kansas

*English Language Arts Test Development Coordinator for Dynamic Learning Maps, 6/2012-present*

- Managed deliverables for the English language arts content team in preparing content and assisting the operations team in opening one pilot test, six field tests, and four operational testing windows for a large-scale computer-based alternate assessment.
- Lead effective test development processes for the reading and writing portion of the Dynamic Learning Maps Alternate Assessment based on the Common Core State Standards for English Language Arts and the Dynamic Learning Maps Essential Elements.
- Supervised up to six graduate research assistants, two full-time staff, and ten temporary workers in all phases of the test development cycle.
- Specialized in the development of reading and writing assessments for students who have significant cognitive disabilities as well as students who have significant cognitive disabilities and who are blind or visually impaired.
- Developed improvement initiatives for the test development cycle which increased efficiencies, improved quality control procedures, and delivered content with greater reliability and validity for each testing window.
- Interfaced with other teams on the project with excellent oral and written communication to create and share organizational tools to streamline efficiencies, collaborated with other test development leads and project management, and fostered open communication between all members of the project.
- Coordinated training and complex processes for two large-scale item writing events, two standard setting events, and was responsible for the management of the English language arts content.
- Demonstrated effective time management skills as evidenced by balancing competing demands and successfully meeting delivery deadlines.
- Managed a highly flexible team in a fast paced iterative test development cycle.
- Proficient with desktop and web-based technologies (e.g., Microsoft Word, Microsoft Excel, email, Skype) as well as with KITE, a specialized proprietary testing software.

University of Kansas, Lawrence, Kansas

*English Language Arts Instructional Design Consultant for the Enhanced Learning Maps Project, 2015-2016*

- Assisted in coordinating deliverables for the English language arts team.
- Collaborated on the creation and review of English language arts instructional resources.
- Contributed to the development of the English language arts portion of the learning map model.

## **Related Presentations and Trainings**

Dynamic Learning Maps Governance Meeting, Kansas City, MO (7/12-7/14/2016)  
Dynamic Learning Maps Science Standard Setting Event, Kansas City, MO (6/15-6/17/2016)  
*English Language Arts Teacher Tools*, Enhanced Learning Maps (ELM) Enhanced Assessment Grant (EAG) State Partner Meeting, Lawrence, KS (4/4/16)  
Alaska Measures of Progress Standard Setting Event, Anchorage, AK (7/5-7/10/2015)  
Dynamic Learning Maps English Language Arts and Mathematics Standard Setting Event, Kansas City, MO (6/15-6/19/2015)  
Dynamic Learning Maps Governance Meeting, Kansas City, MO (12/8-12/9/2015)  
Initial Level Group and Testlet Template Tutorial, Dynamic Learning Maps Science Item Writing Workshop, Kansas City, MO (1/12-1/13/15)  
Dynamic Learning Maps Item Writer Training, Lawrence, KS (6/9-6/13/2014)  
Blind and Visually Impaired Expert Panel Review, Denver, CO (4/4-4/5/2014)  
*Test Development*, Dynamic Learning Maps Partner State Governance Meeting, Kansas City, MO (7/9/2013)  
Dynamic Learning Maps Item Writer Training, Lawrence, KS (6/10-6/14/2013)  
*Dynamic Learning Maps Update*, Michigan Association of Administrators of Special Education, Lansing, MI (4/17/2013)  
*Dynamic Learning Maps Alternate Assessment System: The Alternate Assessment Consortium for Students with Significant Cognitive Disabilities*, Michigan Association of Administrators of Special Education, Lansing, MI (4/17/2013)  
*Instructionally-Relevant Testlet Types Review Session*, Dynamic Learning Maps Alternate Assessment Consortium, Sedalia, MO (1/11/2013)  
*Item Development Update*, Dynamic Learning Maps Governance Committee Meeting, Kansas, City, MO (12/18/2012)  
*Item Development Update*, Dynamic Learning Maps Governance Committee Meeting, Kansas, City, MO (12/18/2012)  
*Dynamic Learning Maps Essential Elements and Assessment*, LEA Representatives and teachers, Salt Lake City, UT (10/11-10/12/2012)

## **Professional Organizations**

Council for Exceptional Children (CEC), 2015-present  
National Council on Measurement in Education (NCME), 2016

## **Related Certifications and Workshops**

Excelling a Manager or Supervisor, SkillPath (8/15/16)  
FERPA 201: Data Sharing, U.S. Department of Education (6/8/2016)  
KSDE Security Awareness, Kansas Department of Education (6/8/2016)  
KSDE Data Security and Privacy Training, Kansas Department of Education (6/7/2016)  
Security Awareness at KU (6/7/2016)  
Sexual Violence/Sexual Harassment: Speak Up! We're Listening (9/30/2015)

Excel 2013 Essentials Workshop (7/16/2015)  
Social & Behavioral Research Course (6/25/2014)  
Research and HIPAA Privacy Protection Course (6/24/2014)

## **RESEARCH EXPERIENCE**

- Current research focuses on the design of large-scale writing assessments for students with significant cognitive disabilities to further develop comprehensive literacy.
- Participated in data collection for test administration observations and cognitive labs with students and teachers.
- Evaluated and used findings to identify opportunities for improvement in content development procedures to improve the technical quality of the assessment system.
- Certified from Human Subjects Compliance Tutorial and approved in the IRB to participate in data collection protocols with human subjects.

### **Professional Presentations**

- Swinburne Romine, R., Karvonen, M., & Shipman, M. (2016, April). *Validity Evidence for a Writing Assessment for Students with Significant Cognitive Disabilities*. Electronic board session presented at the annual meeting of the National Council on Measurement in Education, Washington, D.C.
- Swinburne Romine, R., & Shipman, M. (2016, April). *Instructionally Relevant Large Scale Writing Assessments for Students with Significant Cognitive Disabilities*. Poster session presented at the annual conference of the Council for Exceptional Children, St. Louis, MO.
- Broadus, A., Swinburne Romine, R., Lawrence, A., & Shipman, M. (2015, April). *Alternate Assessment for Students who are Blind or Visually Impaired*. Paper presented at the annual conference of the Council for Exceptional Children, San Diego, CA.
- Swinburne Romine, R., Andersen, L., Nash, B., Shipman, M., Ruhter, L., & Lawrence, A. (2015, October) *Test Development in a Learning Maps Environment*. Conference Workshop given at the annual meeting of the International Association for Educational Assessment, Lawrence, KS.
- Gross, J., & Shipman, M. (2013, June) *Developing Test Items to Assess Students with Significant Cognitive Disabilities in the Alternate Assessment*, Poster session presented at the annual conference for American Association on Intellectual and Developmental Disabilities, Pittsburgh, PA. \*Contributed, did not attend

### **Data Collection - Observation Visits**

Test Administration Observation of Dynamic Learning Maps Reading, Mathematics, Science, and Writing Assessments, Jenks High School, Jenks, OK, Sapulpa Junior High and Jefferson Heights Elementary School, Sapulpa, OK (4/28/2016)

Test Administration Observation of Dynamic Learning Maps Reading, Mathematics, Science, and Writing Assessments, Bixby Middle School and North Elementary School, Bixby, OK (4/21/2016)

Test Administration Observation of Dynamic Learning Maps Reading and Writing Assessments, Jenks High School, Building 6 and East Intermediate School, Jenks, OK (5/8-5/9/2015)

Test Administration Observation of Dynamic Learning Maps Reading and Writing Assessments and Cognitive Labs, Waterloo, IA and Des Moines, IA (5/11-5/13/2015)

Test Administration Observation of Dynamic Learning Maps Writing Assessments, West Middle School, Muscatine, IA and Smouse Opportunity School, Des Moines, IA (2/11-2/12/2015)

Test Administration Observation of Dynamic Learning Maps Field Test, Cedar Ridge School for Severely Disabled, Nevada, MO (5/30/2015)

Observation of an Intervener working with students who are deaf/blind, Nike Elementary, Gardner, KS and Frontier Middle School, Olathe, KS (9/21/2012)

### **Data Collection - Survey Design**

- Assisted with the development the Dynamic Learning Maps Field Test Writing Survey for test administrators, analyzed data from the survey results, and made research-based decisions to improve the writing testlets.

### **TEACHING EXPERIENCE**

Washburn Rural Middle School, Topeka, Kansas  
Grade Eight Language Arts Teacher, 2005-2012

Scranton Attendance Center, Scranton, Kansas  
Life, Physical, and Earth Science Middle School Teacher, 1993-2005

Sacred Heart Catholic Grade School, Topeka, Kansas  
Grade Six Reading and Science Teacher, 1991-1993

# Susan Martin

## Profile

Results-driven program manager who brings top notch consulting and relationship management skills to successfully deploy innovative solutions to address client's business needs. A dedicated, self-motivated achiever who is committed to success and adept at juggling multiple tasks in a high-pressured environment. A great motivator who leads with clear focus, respect and maturity.

### Core Competencies:

Client Relations • Program Leadership • On-Time Delivery Financial Management • Performance Management • Staff Development Process Improvement • Cost Reduction and Avoidance • Strategic Planning  
Critical Thinking • Problem Solving • Decision Making

*"The counsel you provided along the way and your patient and plain-language explanation of the technical issues provided me with the clarity I needed to be able to make sound business decisions. The fact that you and the team performed this difficult work while still managing your day-to-day duties for AA says a lot about your work ethic and commitment to delivering top notch service to your customers." - David Levine, American Airlines (Managing Director, HR)*

## Experience

Director, Agile Technology Solutions, University of Kansas

February 2016 to Present

- Employ agile development methodology including iteration planning, daily standups, demonstrations, and retrospectives. Work closely with clients to define/prioritize business and system requirements for upcoming iterations. Team supports product upgrades, new development, enhancements, support desk, and operational support.
- Play an active role in overseeing program execution. Resolve escalated issues and risks quickly to mitigate impact to delivery timelines or team productivity.
- Conduct regular program status meetings with strategic partners. Review program deliverables, budget, issues and risks.
- In coordination with key stakeholders, developed strategic business goals and vision. Establish project roadmaps to align with the vision.

## Delivery Manager, Hewlett Packard Enterprise

April 1998 to February 2016

- Led delivery team of 65 technical professionals supporting HR, payroll, and financial applications. Technologies include SAP, Siebel, .NET, and Cobol. Team included Project Managers, Developers (both onshore and offshore), Testers, Business Analysts, and Database Administrators.
- Deployed program management skills to bring projects in under budget, on time, and with superior quality. Strived to find new and creative ways to add value and save costs. Focused on mapping resources to appropriate tasks to ensure highly efficient team utilization.
- Conducted regular one on ones with direct reports. Ensured measurable goals were established and progressed throughout the year. Assisted in establishing progression plans to ensure resources can continue to grow and advance. Developed contractual documents for offshore partners to establish clear work expectations/goals.
- Cultivated an atmosphere of collaboration and trust that resulted in high customer satisfaction scores on project surveys.
- Received American Airlines Customer Award for Service Excellence

## Project Lead, Advanced Communication Systems

May 1995 - April 1998

- Supported the day-to-day program management of a satellite control system. Documented system deficiencies, prioritized software version releases, and reviewed requirement/design specifications. Oversaw quality assurance of code releases; handled end-user questions; researched and resolved issues.
- Served as the Technical Lead on software integration projects. Documented system requirements, participated in design reviews, monitored software development and conducted system testing.

## Early Career

Project Analyst, Femme Comp Inc.

Quality Assurance Lead, Nations Incorporated

Programmer, Computer Sciences Corporation

## Education and Professional Training

- Computer Science, Bachelor of Science, University of Kansas
- Software Engineering Institute, Software Quality Assurance
- Software Engineering Institute, Facilitating Skills
- Systems Development Life Cycle Methodology
- Agile Development

## CURRICULUM VITAE

### DAVID H. ROSE

CAST, Inc.

40 Harvard Mills Square, Suite 3

Wakefield, MA 01880

781-245-2212 drose@cast.org

### EDUCATION

- 1976 **Harvard University, Graduate School of Education**, Cambridge, MA  
Ed.D., Human Development & Reading
- 1968 **Reed College**, Portland, OR  
M.A., Teaching
- 1967 **Harvard College**, Cambridge, MA  
B.A., Psychology

### PROFESSIONAL EXPERIENCE

- 1987–Present **CAST (Center for Applied Special Technology)**  
*Co-Founder and Chief Education Officer*  
Wakefield, Massachusetts
- 1985–Present **Harvard Graduate School of Education**  
*Lecturer in Mind, Brain, and Education; Technology, Innovation, and Education*  
Cambridge, Massachusetts
- 1983–1987 **North Shore Children’s Hospital**  
*Director, Medical Educational Evaluation Center*  
Salem, Massachusetts
- 1978–1983 **Children’s Hospital Medical Center**  
*Psychologist, Dept. of Pediatrics, Developmental Evaluation Clinic*  
Boston, Massachusetts
- 1973–1979 **Tufts University**  
*Assistant Professor, Elliot-Pearson Dept. of Child Study*  
Medford, Massachusetts

### RECENT MAJOR RESEARCH GRANTS (since 2007)

- 2014-2019 **Principle Investigator: National Center on Accessible Educational Materials for Learning.** Funded by the U.S. Dept. of Education, Office of Special Education Programs. The Center is building capacity of states, districts, postsecondary institutions, families, publishers, and other stakeholders to provide high-quality accessible educational materials to support improved learning outcomes for students in Pre-K, K-12, postsecondary, and workplace environments.

- 2012–2016 **Principal Investigator: National Center on the Use of Emerging Technologies to Improve Literacy Achievement for Students with Disabilities in Middle School.** Funded by the U.S. Dept. of Education, Office of Special Education Programs. (with Vanderbilt University, University of Arizona)
- 2012–2016 **Co-Principal Investigator: Center for Research in Online Learning for Students with Disabilities.** Funded by the U.S. Dept. of Education, Office of Special Education Programs. With the University of Kansas and the National Association of State Directors of Special Education.
- 2010–2015 **Co-Principal Investigator: Center for Implementation of Technology in Education (CITEd II):** Funded by the U.S. Dept. of Education’s Office of Special Programs (OSEP). With the American Institutes of Research (AIR) and the Education Development Center (EDC).
- 2009–2014 **Principal Investigator: National Center on Accessible Instructional Materials (AIM):** Funded by the U.S. Dept. of Education’s Office of Special Programs (OSEP).
- 2009–2014 **Principal Investigator: National Instructional Materials Accessibility Standard (NIMAS) Center:** Funded by the U.S. Dept. of Education’s Office of Special Programs (OSEP).
- 2007–2011 **Chief Scientist: Principled Science Assessment Design for Students with Disabilities.** Funded by the U.S. Dept. of Education’s Institute of Education Sciences. With SRI International and CAST.
- 2007–2011 **Chief Scientist: The Universally Designed Science Notebook: An Intervention to Support Students with Disabilities in Science Learning.** Funded by the U.S. Dept. of Education’s Institute of Education Sciences. With the Lawrence Hall of Science at the University of California-Berkeley.
- 2007–2011 **Principal Investigator: Universal Design of Inquiry-Based Middle and High School Science Curricula.** Funded by the National Science Foundation. With Education Development Center (EDC) and the University of Michigan.
- 2007–2009 **Principal Investigator: Accessible Instructional Materials (AIM) Consortium:** Funded by the U.S. Dept. of Education’s Office of Special Programs (OSEP).

## RECENT PUBLICATIONS

### Books:

- Meyer, A., Rose, D.H., Gordon, D. (2014). *Universal Design for Learning: Theory and practice.* Wakefield, MA: CAST Professional Publishing. Online at <http://udltheorypractice.cast.org>
- Hall, T.E., Meyer, A., & Rose, D.H. (2012). *Universal Design for Learning in the Classroom: Practical Applications.* New York: Guilford.
- Rose, D.H., & Meyer, A. (Eds.) (2006). *A Practical Reader in Universal Design for Learning.* Cambridge, MA: Harvard Education Press.

- Rose, D., Meyer, A., & Hitchcock, C. (2005). *The Universally Designed Classroom*. Cambridge, MA: Harvard Education Press.
- Rose, D. & Meyer, A., with Strangman, N. & Rappolt, G. (2002). *Teaching Every Student in the Digital Age: Universal Design for Learning*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Meyer, A., & Rose, D. (1998). Learning to Read in the Computer Age. In J. Chall (Series Ed.) & J. Onofrey (Ed.), *From Reading Research to Practice*. Cambridge, MA: Brookline Books.

### **Selected Chapters and Journal Articles (Since 2007)**

- Gravel, J.W. and Rose, D.H. (2015). Universal design for learning in postsecondary education: Reflections on principles and their application. In Burgstahler, S.E., & Cory, R.C. (Eds.), *Universal design in higher education: From principles to practice*. Cambridge, MA: Harvard Education Press.
- Dalton, B. & Rose, D. (2015). Reading digital: Designing and teaching with eBooks and digital text. In S. R. Parris, & K. Headley (Eds.), *Comprehension instruction: Research-based best practices*, 3rd edition. New York: Guilford Press.
- Boucher, A. R., & Rose, D. H. (2015, February). Beyond print: The changing landscape of adolescent reading. *Adolescent Literacy in Perspective*. Retrieved from <http://www.ohiorc.org/adlit/InPerspective/Issue/2015-02/Article/feature1.aspx>
- Rose, D. (2014). Reflections: Universal design for learning and the common core. *The Special EDge*, 27(2), 3–5.
- Rose, D. H., Johnston, S. C., & Vanden Boogart, A. (2014). Eds. Technology and Dyslexia Part 2. *Perspectives on Language and Literacy*, 40(1).
- Rose D. H., Johnston, S.C., & Vanden Boogart, A. (2014). Canaries in the mine: Reading and its disabilities in a post-Gutenberg world. *Perspectives on Language and Literacy*, 40(1), 41-44.
- Rose, D. H., Johnston, S. C., & Vanden Boogart, A. (2013). Eds. Technology and Dyslexia Part 1. *Perspectives on Language and Literacy*, 39(4).
- Rose, D. H., & Gravel, J. W. (2013). Universal design for learning. In L. Florian (Ed.), *SAGE Handbook of Special Education*, 2<sup>nd</sup> Ed. London: SAGE.
- Rose, D. H., & Gravel, J. W. (2013). Using digital media to design student-centered curricula. In R. E. Wolfe, A. Steinberg, & N. Hoffmann (Eds.), *Anytime, anywhere: Student-centered learning for students and teachers*. Cambridge, MA: Harvard Education Press.
- Glass, D., Meyer, A., & Rose, D. H. (2013). The arts and universal design for learning. In *The Harvard Educational Review, Expanding Our Vision for the Arts in Education*, 83(1). Cambridge, MA: Harvard Education Press.
- Dolan, R. P., Burling, K., Harms, M., Strain-Seymour, E., Way, W., & Rose, D. H. (2013). *A Universal Design for Learning-based framework for designing accessible technology-enhanced assessments*. (Research Report). Iowa City, IA: Pearson Education Measurement. Retrieved from [http://images.pearsonclinical.com/images/tmrs/DolanUDL-TEAFramework\\_final3.pdf](http://images.pearsonclinical.com/images/tmrs/DolanUDL-TEAFramework_final3.pdf)

- Karger, J., Rose, D., & Boundy, K. B. (2012). Applying universal design for learning to the education of youth in detention and juvenile corrections facilities. In S. Bahena, N. Cooc, R. Currie-Rubin, P. Kuttner, & M. Ng (Eds.), *Disrupting the school-to-prison pipeline*, 119-143. Cambridge, MA: Harvard Educational Review.
- Chita-Tegmark, M., Gravel, J. W., Serpa, M. deL. B., Domingos, Y., & Rose, D. H. (2012). Using the universal design for learning framework to support culturally diverse learners. *Journal of Education* 192(1): 17-22.
- Rose, D. H., & Gravel, J. W. (2012). Curricular opportunities in the digital age. Students at the Center Series. *Boston: Jobs for the Future*. Retrieved online from [www.studentsatthecenter.org/papers/curricular-opportunities-digital-age](http://www.studentsatthecenter.org/papers/curricular-opportunities-digital-age)
- Rose, D. H., & Gravel, J. W. (2010). Universal design for learning. In B. McGaw, P. Peterson, & E. Baker (Eds.), *International Encyclopedia of Education*, 3rd Ed. Oxford: Elsevier.
- Rose, D. H., & Vue, G. (2010, Winter). 2020's learning landscape: A retrospective on dyslexia. *Perspectives on Language and Literacy*, 33-37.
- Rose, D., & Dalton, B. (2009). Learning to read in the digital age. *Mind, Brain, and Education*, 3(2), 74-83.
- Rose, D., & Gravel, J. W. (2009). UDL, global positioning systems, and lessons for improving education. In D. Gordon, J. Gravel, & L. Schifter (Eds.), *A policy reader in universal design for learning*. Cambridge, MA: Harvard Education Press.
- Rose, D. H., Hall, T. E., & Murray, E. (2008, Fall). Accurate for all: Universal design for learning and the assessment of students with learning disabilities. *Perspectives on Language and Literacy*, 23-28.
- Rose, D., & Rappolt-Schlichtmann, G. (2008). Applying universal design for learning with children living in poverty. In S. B. Neuman (Ed.), *Educating the other America: Top experts tackle poverty, literacy and achievement in our schools*. Baltimore, MD: Paul H. Brookes Publishing.
- Rose, D., & Dalton, B. (2008). Learning in the digital age. In K. W. Fisher, & T. Katzir (Eds.), *Building usable knowledge in mind, brain, and education*. Cambridge University Press.
- Dalton, B., & Rose, D. (2008). Scaffolding digital comprehension. In C. C. Block, & S. R. Parriss (Eds.), *Comprehension instruction: Research-based best practices, second edition*. New York, Guilford Publications: 347-361.
- Rose, D. H., Harbour, W. S., Johnston, C. S., Daley, S. G., & Abarbanell, L. (2008). Universal design for learning in postsecondary education: Reflections on principles and their application. In S. E. Burgstahler, & R. C. Cory (Eds.), *Universal design in higher education: From principles to practice*. Cambridge, MA: Harvard Education Press
- Rose, D. H., Rappolt-Schlichtmann, G., Coyne, P. & Hall, T. (2007). *Technology and the assessment of young children*. Paper commissioned by Committee on Developmental Outcomes and Assessments for Young Children, National Research Council, Washington, DC.
- Rose, D. (2007). Is a synthesis possible? Making doubly sure in research and application. In K. W. Fischer, J. H. Bernstein, & M. H. Immordino-Yang (Eds.), *Mind, brain, and education in reading disorders*. Cambridge University Press: 281-292.

Rose, D., & Strangman, N. (2007). Cognition and learning: Meeting the challenge of individual differences. *Universal Access in the Information Society*, 5(4), pp. 381-391.

Rose, D., & Rose, K. (2007). Deficits in executive function processes: A curriculum-based intervention. In L. Meltzer (Ed.), *Executive function in education: From theory to practice*. New York: Guilford Publications.

### **SELECTED EDUCATIONAL SOFTWARE: AUTHORSHIP & CONSULTING**

*UDIO: A Literacy Platform (In large-scale experimental trials, 2015)*. U.S. Dept. of Education

*ReadAbout*. Scholastic Inc. (2007) New York, NY.

*Thinking Reader*. Scholastic Inc. (2004) New York, NY.

*Bobby™, 3.2*. Watchfire Corporation (Now IBM) (1996-2005)

*Read 180*: Scholastic Inc. (2004-present)

*eReader™*. CAST, Inc. (1996-2000) Peabody, MA.

*ULTimate CaptionWorks™*. (1997) Peabody, MA: Universal Learning Technology, Inc.

*WiggleWorks: Scholastic Beginning Literacy System*. Scholastic, Inc. (1994) New York, NY.

### **RECENT ASSOCIATIONS, BOARDS, AND COMMITTEES**

Member of the National Technical Working Group (TWG) for the National Educational Technology Plan. *U.S. Department of Education*. 2009. Washington, D.C.

Advisory Board. *International Mind, Brain, and Education Society*. 2008 – Present.

Professional Advisory Board Member. *National Center for Learning Disabilities (NCLD)*. October 2005 – 2011.

Board Member. *The Concord Consortium*. June 2005 – Present.

Editorial Board Member, *Trends in Neuroscience & Education*.

Associate Editor, *Journal of Special Educational Technology*.

## BIOGRAPHICAL SKETCH

### TRACEY E. HALL

CAST, Inc.  
40 Harvard Mills Square, Suite 3  
Wakefield, MA 01880  
781-245-2212 thall@cast.org

#### EDUCATION

- 1993 **University of Oregon**, Eugene, OR  
Ph.D., *Special Education*
- 1983 **University of Oregon**, Eugene, OR  
MA, *Special Education*
- 1977 **University of Oregon**, Eugene, OR  
BS, *Elementary/Special Education*

#### PROFESSIONAL EXPERIENCE

- 2001-present **CAST, Inc.: Senior Research Scientist/Instructional Designer**  
Wakefield, MA  
Develop and conduct research on instructional interventions in reading, writing, literacy in the content areas, and assessment. Designs and evaluates instructional approaches and assessment tools focused on strategies and effective teaching research that improve instruction and learning, bringing the principles of Universal Design for Learning to the development of technology-based interventions and assessments.
- 2000-2001 **Consultant**, Texas Center for Reading and Language Arts, Univ. of Texas, Austin
- 2000-2001 **Literacy Consultant**, Voyager Expanded Learning Program, Dallas, TX.
- 1995-2000 **Assistant Professor of Special Education**, Pennsylvania State University,  
Graduate Faculty Member
- 1994-1995 **Research Assoc.**, Behavioral Research and Teaching Program, Univ. of Oregon
- 1991-1995 **Consultant**, National Follow-Through Project, Washington Research Institute,  
Seattle, WA
- 1992-1994 **Research Assistant**, Oregon Research Institute, Eugene, OR
- 1989-1993 **Consultant in Curriculum-Based Measurement**, Special Services Department,  
Bethel School District, Eugene, OR
- 1990-1991 **Consultant**, Curriculum-Based Monitoring Grant, Fern Ridge Public Schools  
Lane County, OR
- 1990-1992 **Trainer/Consult. Progress Monitoring**, State of WA Summer Clinic, Vancouver,  
WA
- 1988-1991 **Field Coordinator**, Department of Teacher Education, Univ. of Oregon
- 1984-1989 **Instructor/Practicum Supervisor**, Dept. of Teacher Education, Univ. of Oregon
- 1983-1984 **Director of Special Education and Curriculum Coordinator**, Creswell School  
District, Creswell, OR
- 1977-1982 **Special Education Teacher and Supervisor**, Jackson County Education Service  
District, Medford, OR
- 1979-1980 **Prjct. Supervisor/Instructor**, Jackson County Ed. Service District, Medford, OR

#### SELECTED GRANTS AND CONTRACTS

- 2015-2020, **Principal Investigator**, CFDA #84.327S, *The UDL Science Notebook: Scaling an Inclusive Solution to Sense Making in Science*. In this implementation and research project we are creating a suite of tools and professional learning resources to support the scaled and effective use of CAST's evidence-based Universally Designed for Learning Science Notebook (UDSN). The UDSN was developed under funding from the Institute of Education Sciences and provides access to science notebooks for 4<sup>th</sup>-6<sup>th</sup> grade students with learning disabilities in inclusive classrooms whose difficulties reading and writing prevent them from engaging in science. U.S. Department of Education, OSEP.

- 2014-2018, **Co-Principal Investigator**, NSF DRL: DRK12 13-601, *Reclaiming Access to Inquiry-Based Science Education (RAISE) for Incarcerated Students: An investigation of Project-Based Inquiry Science within a Universal Design for Learning Framework in Juvenile Corrections Settings*. University of Massachusetts-Amherst, CAST Sub-award. CAST will join as a research and development partner creating and implementing a Project-Based Inquiry Science (PBIS) program within a UDL framework for high school students incarcerated in juvenile corrections agencies. National Science Foundation.
- 2012-2016, **Senior Research Scientist**, CFDA #84.327M, *Center on the Use of Emerging Technologies to Improve Literacy Achievement for Students with Disabilities in Middle School*. CAST partnership with Vanderbilt University, Researching and developing the Universal Literacy Network—a technology-rich learning environment for schools to provide personalized literacy support across content areas to students throughout the school day. U.S. Department of Education, OSEP.
- 2012-2016, **Senior Research Scientist**, *Center for Research in Online Learning for Students with Disabilities*. CAST, in collaboration with the University of Kansas and the National Association of State Directors of Special Education, is conducting research on how K-12 online learning impacts the access, participation, and progress of students with disabilities. Research outcomes are expected to inform the design, selection, and implementation of online digital curriculum materials, the systems that deliver and support them, and the instructional practices associated with their use, in order to increase their efficacy for students with disabilities and other elementary and secondary learners. U.S. Department of Education, OSEP.
- 2011-2014, **Principal Investigator**, CFDA #84.305A, *Creating Compositions using a Technology-Based Writing Tool: Supporting Students with Universal Design for Learning*. CAST collaboration with Arizona State University. Developing and formatively evaluating a web-based guided process writing tool to support middle school students in writing persuasive and expository compositions. U.S. Department of Education, IES.
- 2010-2011, **Co-Principal Investigator**, *A Comprehensive Universal Design for Learning Approach to Improve Reading Across the Curriculum for High-Need Students*. First phase of a significant district-based implementation initiative that uses Universal Design for Learning to address poor reading comprehension skills across content areas in the middle grades. The Bill & Melinda Gates Foundation.
- 2010-2014, **Senior Research Scientist**, NSF DRK12 #DRL-0628171, *Biocomplexity: Transforming an innovative curriculum with UDL scaffolds and resources*. CAST collaboration with TERC. Building UDL multi-media resources into the Biocomplexity curriculum. National Science Foundation.
- 2009-2012, **Project Director/Senior Research Scientist**, *Developing an Interactive On-Line Writing Lab (I-OWL) to Increase Student Success in Common Writing Standards*. CAST collaboration with Purdue University and the University of Wisconsin. Creating an interactive writing lab (H-OWL) to increase 11<sup>th</sup>-12<sup>th</sup>-grade students' success in support of college and career readiness. The Bill & Melinda Gates Foundation.
- 2009-2014, **Senior Research Scientist**, CFDA #84.327G, *Center on Technology Implementation*. American Institutes for Research (AIR), CAST Sub-award. Developing implementation resource kits and an implementation practice guide to support states, districts and schools in implementing technology practices to improve achievement of students with disabilities. U.S. Department of Education, OSEP.
- 2005-2009, **Principal Investigator**, CFDA #84.327B, *Monitoring Students Progress Towards Standards in Reading: A Universally Designed Curriculum-Based Measurement System*. Investigating CBM embedded into an instructional reading environment with additional supports to help teachers make data-driven decisions and to differentiate instruction. Technology and Standards-Based Reform, U.S. Department of Education, OSEP.
- 2005-2009, **Senior Research Scientist**, CAST Project Director, CFDA #84.324U, *National Collaborative Center on Standards and Assessment Development*. University of Kentucky

- Research Foundation, CAST Sub-award. Guiding the integration of the UDL Guidelines into alternative assessments for use by states. U.S. Department of Education, OSEP.
- 2006-2008, **Co-Principal Investigator**, with Elizabeth Murray, CFDA #84.327A, *Phase II Science Writer: A Universally Designed Thinking Writer*. Supports include instructional scaffolds and progress monitoring to inform instruction; efficacy study. Steppingstones of Technology Innovation for Students with Disabilities, U.S. Department of Education, OSEP.
- 2004-2007, **Director**, *CAST Writing Initiative*. Developing and researching universally designed technology environments that support writing for students with learning disabilities. The Emily Hall Tremaine Foundation, Oak Foundation, and Charles and Helen Schwab Fdn.
- 2001-2006, **Co-Principal Investigator**, with Robert Dolan, *Improving Test Fairness and Accuracy for students with Learning Disabilities through Universal Design for Learning & Technology*. Peter Jay Sharp Foundation and the LD ACCESS Foundation.
- 1999-2004, **Director of Curriculum**, CFDA #84.324H, *National Center on Accessing the General Curriculum*. A collaborative agreement between CAST and the U.S. Department of Education, OSEP.
- 1999-2002, **Co-Director**, with Robert Stevens and Peggy Van Meter, *Reading And Intensive Learning Strategies (RAILS): A Model of Early Reading Instruction with Progress Monitoring*. Model Demonstration Project, U.S. Department of Education, OSERS.

## SELECTED PUBLICATIONS

### Refereed Journals

- Drogalis, A. R., McDermott, P. A., Watkins, M. W., & Hall, T. E., (2016). Parent and teacher perspectives on psychological adjustment: A national measurement study in Trinidad and Tobago. *International Journal of School & Educational Psychology*. DOI: 10.1080/21683603.2016.1191398
- Mcdermott, P. A., Watkins, M. A., Drogalis, A. R., Chao, J. L., Worrell, F. C., & Hall, T.E. (2016). Classroom contexts as the framework for assessing social-emotional adjustments: A national studying Trinidad and Tobago. *Psychology in the Schools* 53(6) 626–640. DOI: 10.1002/pits.21930.
- Hall, T. E., Cohen, N., & Vue, G., Ganley, P. (2015). Addressing learning disabilities with UDL and technology: Strategic reader. *Learning Disabilities Quarterly*, 38(2), 72–83. DOI: 10.1177/0731948714544375
- McDermott, P. A., Watkins, M. W., Rhoad, A. M., Chao, J. L., Worrell, F. C., & Hall, T. E. (2015). Trinidad and Tobago National Standardization of the Adjustment Scales for Children and Adolescents. *International Journal of School & Educational Psychology*, 3(4), 278-292.
- Vue, G., Hall, T.E., Robinson, K., Ganley, P., Elizalde, E. & Graham, S. (2015) Informing Understanding of Young Students' Writing Challenges and Opportunities: Insights From the Development of a Digital Writing Tool that Supports Students with Learning Disabilities. *Learning Disabilities Quarterly*
- Watkins, M.W. Hall, T. E., & Worrell, F. C., (2015) From central guidance unit to student support services unit: The outcomes of a consultation process in Trinidad and Tobago. *Journal of Educational and Psychological Consultation*. (1047-4412)
- Planck, J. A., Watkins, M. W., Worrell, F. C., & Hall, T. E., (2013). Anxiety disorder symptoms in Trinidadian adolescents. *The International Journal of Educational and Psychological Assessment*, 13(1), 51-73.
- George, S. M, McDermott, P. A., Watkins, M. W., Worrell, F. C., & Hall, T. E. (2012). The assessment of youth psychopathology in Trinidad and Tobago: A cross-cultural construct validity study of the adjustment scales for children and adolescents. *The International Journal of Educational and Psychological Assessment*, 10(1), 159-178.
- Rose D. H., Hall, T. E., & Murray, E. (2008). Accurate for all: Universal design for learning and the assessment of students with learning disabilities. *Perspectives on Language and Literacy*, 34(4), 23-28.

- Stevens, R. J., Van Meter, P., & Hall, T. E. (2008). Reading and Integrated Literacy Strategies (RAILS): An integrated approach to early reading. *Journal of Education for Students Placed At Risk*, 13(4), 357-380.
- Worrell, F., Watkins, M., & Hall, T. E. (2008). Reliability and validity of self-concept scores in secondary school students in Trinidad and Tobago. *School Psychology International*, 29(4), 466-480.
- Dolan, R. P., & Hall, T. E. (2007). Developing accessible tests with universal design and digital technologies: Ensuring we standardize the right things. In C. C. Laitusis, & L. L. Cook (Eds.), *Large-scale assessment and accommodations: What works* (pp. 95-111). Arlington, VA: Council for Exceptional Children.
- Rose, D. H., Rappolt-Schlichtmann, G., Coyne, P., & Hall, T. (2007). *Technology and the assessment of young children*. Paper commissioned by the Committee on Developmental Outcomes and Assessments for Young Children, Board on Children, Youth, and Families, Board on Testing and Assessment, Division of Behavioral and Social Sciences and Education, National Research Council, Washington, DC.
- Dolan, R. P., Hall, T. E., Banerjee, M., Chun, E., & Strangman, N. (2005). Applying principles of universal design to test delivery: The effect of computer-based read-aloud on test performance of high school students with learning disabilities. *Journal of Technology, Learning, and Assessment*, 3(7). Available from <http://www.jtla.org>.
- Tindal, G., Marr, J., Hall, T. E., McCullum, N., Goldman, P., & Cole, C. (2005). Developmentally appropriate practice (DAP) from a student performance assessment perspective: A study of variance. *Journal of Special Education*.
- Wolfe, P. S., & Hall, T. E. (2003). Accommodations for students with severe disabilities in content area instruction: Making inclusion a reality. *Teaching Exceptional Children*, 35(4), 56-60.
- Dolan, R. P., & Hall, T. E. (2001). Universal design for learning: Implications for large-scale assessment. *IDA Perspectives*, 27(4), 22-25.
- Hall, T. E., & Hughes, C. A. (2001). Computer assisted instruction for students with reading disabilities: A research synthesis. *Education and Treatment of Children*, 23(2), 173-193.
- Hall, T. E. (1998). Monitoring minority student progress in special education using curriculum-based outcomes assessment. *Diagnostique*, 23(3), 141-166.

### **Books/Chapters**

- Hall, T. E., Meyer, A., & Rose, D. H. (2012). *Universal design for learning in the classroom: Practical applications*. New York: Guilford.
- Hall, T. E., Meyer, A., & Rose, D. H. (2012). An introduction to universal design for learning: Questions and answers. In T. E. Hall, A. Meyer, & D. H. Rose (Eds.), *Universal design for learning in the classroom: Practical applications*. New York: Guilford.
- Vue, G., & Hall, T. E. (2012). Transforming writing instruction with universal design for learning. In T. E. Hall, A. Meyer, & D. H. Rose (Eds.), *Universal design for learning in the classroom: Practical applications*. New York: Guilford.
- Cohen, N., Hall, T. E., Vue, G., & Ganley, P. (Dec. 2011). Reading in a UDL-designed digital environment: Assessment and support with the strategic reader. In P. Noyce, *New frontiers in formative assessment*. Cambridge, MA: Harvard Education Press.
- Dolan, R. P., & Hall, T. E. (2009). Developing accessible tests with universal design and digital technologies: Ensuring we standardize the right things. In D. Gordon, J. Gravel, & L. Schifter (Eds.), *A policy reader in universal design for learning*. Cambridge, MA: Harvard Ed. Press.
- Rose, D., Hall, T. E., & Murray, E. (2009). Universal design for learning and the assessment of students with learning disabilities. In D. Gordon, J. Gravel, & L. Schifter (Eds.), *A policy reader in universal design for learning*. Cambridge, MA: Harvard Education Press.
- Dolan, R. P., & Hall, T. E. (2007). Developing accessible tests with universal design and digital technologies: Ensuring we standardize the right things. In C. C. Laitusis, & L. L. Cook (Eds.), *Large-scale assessment and accommodations: What works* (pp. 95-111). Arlington, VA: Council for Exceptional Children.

Hall, T. E., & Stahl, S. (2006). Using universal design for learning to expand access to higher education. In M. Adams, & S. Brown (Eds.), *Inclusive learning in higher education*. London: Routledge Falmer.

Hall, T. E., Meyer, A., & Strangman, N. (2005). UDL implementation: Examples using best practices and curriculum enhancements. In D. H. Rose, A. Meyer, & C. Hitchcock (Eds.), *The universally designed classroom: Accessible curriculum and digital technologies*. Cambridge, MA: Harvard Education Press.

### **HONORS, RECOGNITION, AND SERVICE**

Board of Directors, Big Brothers, Big Sisters of Central MA/Metro-West, MA, 2003 to present  
Executive Board, National Institute for Direct Instruction, 1998-2001

Board of Directors, Association for Direct Instruction, 1989-1995

Postdoctoral Fellowship, Division of Learning and Instructional Leadership, University of Oregon, Eugene, OR, 1993-1995

## **Robert P. Dolan**

184 N. Leverett Rd.  
Leverett, MA 01054  
+1-413-367-6199  
rdolan@alum.mit.edu

### **EDUCATION**

**Massachusetts Institute of Technology**  
**Ph.D. Brain & Cognitive Sciences, 1992**

**Cornell University**  
**B.S. Biology, 1984**

### **RESEARCH AND PROFESSIONAL EXPERIENCE**

**Diverse Learners Consulting, Leverett, MA**

**July 2013 – present**

**Principal**

Providing product design, e-learning, and assessment consultation in healthcare and education. Design efforts focus on personalized and adaptive instructional and user experience design, with an emphasis on universal design and advanced data analytics to support inclusive, effective solutions. Management consulting efforts focus on research-based product road-mapping and continuous improvement planning and implementation.

**CueThink, Boston, MA**

**December 2015 – July 2016**

**Principal Research Scientist**

Leading NSF-funded research efforts to support e-learning product design and evaluation. CueThink provides social, collaborative, and interactive learning environments for elementary through high school math students and their teachers. Their innovative tablet-based application improves students' critical thinking and math communication skills. The companion product, CueTeach, provides teachers adaptive supports for improving students' problem-solving skills and math communication.

**Landmark College, Putney, VT**

**Spring 2016**

**Adjunct Faculty**

Course designing and instruction within the college's *Certificate in Universal Design: Technology Integration* program, deploying innovative approaches that walk-the-talk of effective, accessible e-learning.

**Pearson, Research & Innovation Network, Austin, TX**

**November 2007 – July 2013**

**Senior Research Scientist**

Research, design, development, and evaluation of innovative, technology-based formative and summative assessment and instruction systems for use in elementary, secondary, and post-secondary education. Focused on application of advanced cognitive and performance assessment techniques, adaptive learning, and educational data mining, with an emphasis on usability and accessibility.

**Center for Applied Special Technology (CAST), Wakefield MA**

**June 2000 – November 2007**

**Senior Research Scientist**

Led K-12 educational technology research initiatives to develop novel science learning environments that use adaptive and flexible methods to accommodate learner differences. Established research and development program on accessible, computer-based testing. Advancing use of state-of-the-art measurement techniques such as eye tracking to understand students' use of educational materials. Researching and developing ontology-based systems to support automated generation of individualized learning materials.

**Analogic Corporation, Peabody MA**

**Sep 1997 – June 2000**

**Principal Engineer**

Created successful product line of web-based telemedicine systems designed to integrate with healthcare enterprise, including PACS (Picture Archiving and Communications) and HIS (Hospital Information Systems). Served as project lead and principal system designer, developing systems that employed leading-edge web, database, graphical user interface, and image processing technologies. Established state-of-the-art engineering practices for software development group, including software configuration management, integrated defect tracking, scheduling, and document-driven design practices. Worked closely with OEM customers and served actively on industry committees within medical imaging community.

**EPIX Medical, Inc., Cambridge MA****June 1994 – Aug 1997****Director of Research, Image Analysis**

Established and directed medical imaging lab for start-up pharmaceutical company. Co-designed and implemented Phase I and II clinical trials for a diagnostic imaging agent for detecting arterial disease. Led software development program for advanced 3D image processing, analysis, and display, including automated tissue segmentation algorithms using scene-based and object-based recognition schemes. Developed internal web-based image distribution system.

**Total Solutions, Cambridge MA****Jan 1984 - Sep 1997****Proprietor**

Contract programming, application development, user interface design, and technical writing for scientific research market. Specialized in real-time data collection, analysis, and control, as well as image processing and animation. Projects included human vision research, automated morphometry, and medical image processing and display. Created successful commercial software package for morphometric analysis and reconstruction (Lucida™).

**Harvard Medical School, Beth Israel Hospital, Boston MA****Dec 1993 – June 1994****Postdoctoral Research, Department of Radiology Research**

Conducted research on state-of-the-art techniques in acquisition and display of high-resolution MRI imaging. Designed and implemented ultra-fast, ultra-high resolution MRI pulse sequences on clinical scanners which permit extremely high resolution imaging in real time, as well as measurement of cardiovascular parameters such as blood velocity and pressure. Studied the interpretation of these clinical and modeled medical image data using novel and existing display conditions (e.g. animation, stereography, holography). Research identified elements of the data which convey diagnostic information and determined the best methods for collecting and displaying this information.

**Centre d'Etudes Nucleaires de Saclay, France****Oct 1992 - Oct 1993****Research Scientist**

Conducted research modeling and assessing Parkinson's and Huntington's diseases following striatal lesions and neuronal transplantation using behavioral assessment and PET and MRI imaging. Studied limb and body movements in Parkinson's and Huntington's diseases in humans and non-human primate models. These movement analyses were used in modeling of basal ganglia function and in assessment of neural grafting techniques. Designed and built a video-based motion tracking system for freely moving subjects, used to monitor pathological events following induction of striatal lesions in non-human primates and following transplantation in human patients and non-human primate subjects.

**M.I.T., Dept. of Brain & Cognitive Sciences****Aug 1986 – Aug 1992****Doctoral Thesis Research**

Conducted research on parallel information processing in the visual system. Studied the role of parallel channel organization in information processing in the monkey and human visual systems, concentrating on the ON and OFF channels. Research involved blockage and adaptation of individual channels through pharmacological and psychophysical means and study of the visual effects, assessed through visual psychophysics and electrophysiology.

**Harvard Medical School, Mass. General Hospital, Boston MA****Jan 1991 – Mar 1992****Research Associate, Department of Radiology**

Conducted research evaluating medical image rendering techniques. Designed project to evaluate the effectiveness of various medical image rendering techniques in conveying visual information. Three-dimensional, time-based cardiac images were acquired through a fast-scan MRI, and were displayed to trained diagnosticians and untrained subjects as 2-D, 2-D multi-slice, and 3-D animation sequences.

**Cornell University, Dept. of Psychology****Jan 1983 – Aug 1986****Systems Programmer, Depts. of Psychology, Mathematics & Engineering**

Designed, implemented, and supported interactive graphic software systems for use in morphometric analysis and reconstruction. Designed a programmable real-time simulation environment, with emphasis on development of interactive language parsing software, include a custom graphics kernel for research on graphical representations of fractal geometries.

**RECENT ADVANCED TRAINING**

MIT Professional Education, *Tackling the Challenges of Big Data*, March 2014.

**RESEARCH AWARDS**

- U.S. Dept. of Education, Institute of Education Sciences, Assessment for Accountability Program  
Co-principal Investigator, *Principled Science Assessment Designs for Students with Disabilities*, 2007-2010.
- U.S. Dept. of Education, Institute of Education Sciences, Special Education Math and Science Program  
Principal Investigator, *The Universally Designed Science Notebook: An Intervention to Support Science Learning for Students with Disabilities*, 2007-2010.
- LD Access Foundation  
Principle Investigator, *Improving Large-Scale Assessment for Students with Learning Disabilities through Technology and Universal Design for Learning*, 2002–2007.
- National Science Foundation, Division of Information & Intelligent Systems, Advanced Learning Technologies Program  
Principal Investigator, *Dynamic Generation of Individualized Digital Learning Materials for Learners with Disabilities through Automatic Analysis of Pedagogical Intent Semantics and Learner Requirements*, 2004–2006.
- National Institute on Child Health and Human Development, R03 Award  
Principal Investigator, *Eye Movements During Reading of Feature-Enriched Text*, 2003–2005.
- U.S. Dept. of Education, Office of Special Education Programs, Directed Research Program  
Co-principal Investigator, *Universal Design of Assessment: Applications of Technology*, 2002–2005.

**MAJOR RESEARCH CONTRACTS**

- U.S. Dept. of Education, Student Achievement and School Accountability Programs, Enhanced Assessment Grant  
(lead state: Rhode Island)  
*Reaching ‘Students in the Gap’ through Web-based Task Module Assessments*, February 2005 – May 2006
- U.S. Dept. of Education, Student Achievement and School Accountability Programs, Enhanced Assessment Grant  
(lead state: Rhode Island)  
*The New England Compact: A Four-State Consortium to Enhance the Quality of Their State Assessment Systems*, 2003–2005
- U.S. Dept. of Education, Student Achievement and School Accountability Programs, Enhanced Assessment Grant  
(lead state: Colorado)  
*Alternate Assessment Collaborative*, 2003–2005

**ADVISORY BOARDS**

- Customizing Mathematics Curricula with Intelligent Tutoring and Universal Design, U. MA-Amherst (2008-2012)
- Principled Science Assessment Designs for Students with Disabilities, CAST & U.C. Berkeley (2008-2011)
- Universal Design of Inquiry-Based Science Curricula, CAST, EDC & Univ. of MI (2007-2011)
- National Accessible Reading Assessment Projects (NARAP) Technical Advisory Board, ETS (2004-2010)
- Maine Educational Assessment Online Testing Advisory Committee, ME Dept. of Education (2003-2006)
- China-US Conference on Aligning Assessment with Instruction Steering Committee, Beijing (July 2005)
- National Assistive Technology Research Institute Advisory Board, Univ. of KY-Lexington (2002-2004)
- Commonwealth Accountability Testing System Online Advisory Committee, KY Dept. of Education (2001-2004)
- NCLB/IDEA Assessment Advisory Panel, U.S. Department of Education (2003)
- National File Format Technical Panel, U.S. Department of Education (2002-2003)

**OTHER APPOINTMENTS**

- Editorial Board, *Journal of Technology, Learning, and Assessment* (2005-2010)

**PROFESSIONAL SOCIETIES**

- American Psychological Association  
International Educational Data Mining Society  
Sigma Xi

**ADDITIONAL RELEVANT TEACHING EXPERIENCE**

University of Massachusetts Amherst, College of Information and Computer Science (2015)

Harvard University, Graduate School of Education (2006-2007)

**SELECT PUBLICATIONS**

- Dolan, R. P., & Burling, K. S. (in press). Computer-based Testing in Higher Education. In C. Secolsky (Ed.), *Handbook on Measurement, Assessment, and Evaluation in Higher Education* (2<sup>nd</sup> ed.). New York: Routledge.
- Dolan, R. P. & Powers, S., (in preparation). Effect of Visual Element Integration on their Use by Typical and Struggling Readers.
- Dolan, R. P., Burling, K., Harms, M., Strain-Seymour, E., Way, W. & Rose, D. H. (2013) *A Universal Design for Learning-based Framework for Designing Accessible Technology-Enhanced Assessments* (Research Report). Iowa City, IA: Pearson. [http://researchnetwork.pearson.com/wp-content/uploads/Dolan\\_UDL-TEA\\_Framework\\_final\\_3.pdf](http://researchnetwork.pearson.com/wp-content/uploads/Dolan_UDL-TEA_Framework_final_3.pdf)
- Dolan, R. P., & Burling, K. S. (2012). Computer-based Testing in Higher Education. In C. Secolsky (Ed.), *Handbook on Measurement, Assessment, and Evaluation in Higher Education* (pp. 321-335). New York: Routledge.
- Dolan, R. P. (2012). *Formative Assessment by Teachers—and Computers?* (Research Brief). Iowa City, IA: Pearson. <http://researchnetwork.pearson.com/wp-content/uploads/Formative.pdf>
- Dolan, R. P. (2012). *Accessibility: Providing Opportunities for Diverse Learners* (Research Brief). Iowa City, IA: Pearson. <http://researchnetwork.pearson.com/wp-content/uploads/Accessibility.pdf>
- McClarty, K. L., Orr, A., Frey, P., Dolan, R. P., Vassileva, V. & McVay, A. (2012) *A Literature Review of Gaming in Education* (Research Report). Iowa City, IA: Pearson. [http://www.pearsonassessments.com/hai/Images/tmrs/Lit\\_Review\\_of\\_Gaming\\_in\\_Education.pdf](http://www.pearsonassessments.com/hai/Images/tmrs/Lit_Review_of_Gaming_in_Education.pdf)
- Dolan, R. P., Goodman, J., Strain-Seymour, E., Adams, J. & Sethuraman, S. (2011). *Cognitive Lab Evaluation of Innovative Items in Mathematics and English Language Arts Assessment of Elementary, Middle, and High School Students* (Research Report). Iowa City, IA: Pearson. [http://www.pearsonassessments.com/hai/images/tmrs/Cognitive\\_Lab\\_Evaluation\\_of\\_Innovative\\_Items.pdf](http://www.pearsonassessments.com/hai/images/tmrs/Cognitive_Lab_Evaluation_of_Innovative_Items.pdf)
- Burling, K. S., Dolan, R. P., Frank, J., Full, D., LaMarche, W. E., Nichols, P., et al. (2010). Recommendations Related to the Operational Implementation of Performance Assessments Within Ohio's K-12 Assessment System (White paper). Iowa City, IA: Pearson. [http://www.pearsonassessments.com/NR/rdonlyres/D8307AB2-39E7-4CCD-8555-31B93F84D6D7/0/Ohio\\_PerformanceAssess.pdf](http://www.pearsonassessments.com/NR/rdonlyres/D8307AB2-39E7-4CCD-8555-31B93F84D6D7/0/Ohio_PerformanceAssess.pdf)
- Dolan, R. P., Strain-Seymour, E., Deokar, A., & Ostler, W. (2010). *Next-Generation Assessment Interoperability Standards* (White Paper). Iowa City, IA: Pearson. [http://www.pearsonassessments.com/NR/rdonlyres/80F6D77A-94E3-4225-9392-CB43E96616D0/0/AssessmentInteroperabilityStandards\\_FINAL\\_111710.pdf](http://www.pearsonassessments.com/NR/rdonlyres/80F6D77A-94E3-4225-9392-CB43E96616D0/0/AssessmentInteroperabilityStandards_FINAL_111710.pdf)
- Strain-Seymour, E., Way, W. D., & Dolan, R. P. (2009). *Strategies and Processes for Developing Innovative Items in Large-Scale Assessments* (Research Report). Iowa City, IA: Pearson Education. <http://www.pearsonassessments.com/NR/rdonlyres/7CDF60A7-782E-41BF-897D-72CEA94B3ADF/0/StrategiesandProcessesforDevelopingInnovativeItemsinLargeScaleAssessments.pdf>
- Way, W. D., Dolan, R. P., & Nichols, P. (2009). Psychometric Challenges and Opportunities in Implementing Formative Assessment. In H. L. Andrade & G. J. Cizek (Eds.), *Handbook of Formative Assessment* (pp. 297-315). NY: Routledge.
- Dolan, R. P., & Hall, T. E. (2007). Developing accessible tests with universal design and digital technologies: Ensuring we standardize the right things. In L. L. Cook & C. C. Cahalan (Eds.), *Large-scale Assessment and Accommodations: What Works* (pp. 95-111). Arlington, VA: Council for Exception Children.
- Dolan, R. P., Burling, K. S., Harms, M., Beck, R., Hanna, E., Jude, J., et al. (2006). *Universal Design for Computer-Based Testing Guidelines*. Iowa City, IA: Pearson. <http://www.pearsonassessments.com/udcbl/>
- Rose, D. H., & Dolan, R. P. (2006). Implications of Universal Design for Learning for Classroom Assessment. In D. H. Rose & A. Meyer (Eds.), *A Practical Reader in Universal Design for Learning*. Cambridge, MA: Harvard Education Press.
- Fleming, J., Kearns, J., Dethloff, A., Lewis, P., & Dolan, R. (2006). Technology Skills Checklist for Online Assessment. *Special Education Technology Practice*, 8(1).

- Dolan, R. P., Murray, E. A., & Strangman, N. (2006). *Mathematics Instruction and Assessment for Middle School Students in the Margins: Students with Learning Disabilities, Students with Mild Mental Retardation, and Students Who are English Language Learners*. Wakefield, MA: CAST, Inc.
- Dolan, R.P. Hall, T.E., Banerjee, M. & Chun, E.J. (2005). Applying Principles of Universal Design to Test Delivery: Effect of Computer-based Read-aloud on Testing of High School Students with Learning Disabilities. *Journal of Technology, Learning & Assessment*, 3(7), 4-32..
- Dolan, R.P. & Hall, T.E. (2001). Universal Design for Learning: Implications for large-scale assessment. *International Dyslexia Society Perspectives*, 27(4), 22-25.
- Dolan, R.P. & Rose, D. (2000). Accurate assessment through Universal Design for Learning. *Journal of Special Education Technology*, 15(4).
- Dolan, R.P., & Schiller, P.H. (1994). Effects of ON channel blockade with 2-amino-4-phosphonobutyrate (APB) on brightness and contrast perception in monkeys. *Visual Neuroscience*, 11(1), 23-32.
- Dolan, R.P., & Schiller, P.H. (1989). Evidence for only depolarizing rod bipolar cells in the primate retina. *Visual Neuroscience*, 2(5), 421-424.

### **SELECT RECENT PRESENTATIONS & ABSTRACTS**

- Dolan, R.P (2013). *Is there a role for formalized tools in formative assessment*. Presentation at the Council of Chief State School Officers National Conference on Student Assessment, Washington, D.C., June 2013.
- Wylie, C. & Dolan, R.P. (2013). *The role of formalized tools in formative assessment*. Paper presented at the AERA Annual Meeting, San Diego, CA, April 2013.
- Dolan, R. P. & Powers, S. (2012). *Effects of text and visual element integration schemes on online reading behaviors of typical and struggling readers*. Poster presented at the Eleventh Annual International Conference on Intelligent Tutoring Systems, Chania, Greece, June 2012.
- Behrens, J. T. & Dolan, R. P. (2012). *Five aspirations for educational data mining*. Invited keynote address at the International Educational Data Mining Society, Chania, Greece, June 2012.
- Forsyth, C. M., Pavlik, P., Graesser, A.C., Cai, Z., Germany, M., Millis, K., Butler, H., Halpern, D., & Dolan, R. P. (2012). *Learning gains for core concepts in a serious game on scientific reasoning*. Paper presented at the International Educational Data Mining Society, Chania, Greece, June 2012.
- Dolan, R. P. (2011). *How not to be overly accommodating: Diversity through inherent flexibility*. Paper presented at the National Council on Measurement in Education Annual Meeting, New Orleans, LA, April 2011.
- Dolan, R. P. (2010). *Construct-Irrelevant Variance*. Paper presented at the Reidy Interactive Lecture Series, Cambridge, MA, October 2010.
- Dolan, R. P. (2010). *Cutting-Edge Technology Issues on the High-Stakes Testing Horizon*. Paper presented at the Eighth Annual Testing Agencies Disability Forum, Reston, VA, November 2010.
- Woolf, B. P., Arroyo, I., Muldner, K., Burleson, W., Cooper, D., Dolan, R. P., & Christopherson, R. M. (2010). *The effect of motivational learning companions on low-achieving and learning disability students*. Paper presented at the Tenth Annual International Conference on Intelligent Tutoring Systems, Pittsburgh, PA, June 2010.
- Burling, K. S. & Dolan, R. P. (2010). *Using cognitive interviews to design instructionally relevant simplifications and supports for an interactive computer-based AA-MAS*. Paper presented at the National Council on Measurement in Education Annual Meeting, Denver, CO, April 2010.
- Dolan, R. P., Way, W. D., & Nichols, P. (2009). *Technical quality of technology-based formative assessment systems*. Paper presented at the AERA Annual Meeting, San Diego, CA, April 2010.
- Dolan, R. P. & Susbury, S. (2009). *Accessible design of innovative assessment items through universal design*. Presentation at the NCTI Technology Innovators Conference, Washington, DC, November 2009.
- Dolan, R.P (2008). *Formative assessment to guide instruction within a technology-based universally designed framework*. Presentation at the Council of Chief State School Officers Conference on Large-Scale Assessment, Orlando, FL, June 2008.
- Dolan, R.P., Wilder-Smith, C., Rose, D., Price, K, Johnson, M., Goldowsky, B., Brigham, K. & Ganley, P. (2008). *Generation of individualized middle school science materials based upon pedagogic intent of content elements*. Paper presented at the AERA Annual Meeting, New York, NY, March 2008.

# BRUCE THOMAS YELTON

---

## AREAS of EXPERTISE

- School Improvement
  - Program Evaluation
  - Statistical Analysis
  - Data Management
  - Teacher Preparation
  - Population Sampling
  - Survey Design
  - Early Education
  - Grant Writing
- 

## PROFESSIONAL HISTORY

- 2011 – Current**      **Proprietor**, BYC Consulting, Charlotte, NC. Independent evaluation and research consulting.
- 1995 – 2011**      **COO**, Praxis Research, Inc., Charlotte, NC. Contract research and evaluation firm. Management, client relations, marketing, project supervision.
- 2001 – 2010**      **Graduate Faculty**, Western Carolina University; Winthrop University; University of North Carolina at Charlotte. Instructor for graduate courses in educational research methodology and statistics. Course contents include both qualitative and quantitative methods, descriptive and inferential statistics. Teacher preparation classes for the Jamaican Ministry of Education.
- 1993 – 1996**      **Research Analyst**, Charlotte-Mecklenburg Schools, Charlotte, NC. Researcher, evaluator, data analyst for various programs including: “Benchmark Goals” (academic outcomes accountability), “CMS Student Surveys” (annual feedback on the performance of their schools and district), “English as a Second Language” (annual goals).
- 1990 – 1993**      **Director**, Child & Family Program, Wake Forest University, Bowman-Gray School of Medicine/ N.C. Baptist Hospital, Winston-Salem, NC. Responsible for all aspects of the operation of an employer sponsored child care program and associated family services, ages infant through five years, enrollment 280. Staff of 60. National Association for the Education of Young Children accredited. Guest lecturer physician education program.
- 1988 – 1990**      **Research Associate**, RMC Research Corporation, Hampton, NH. Director of Federal Title III technical assistance Northeastern Region, consultant with Title I technical assistance, and National Family Involvement Center. Responsible for technical assistance to Northeastern US and Puerto Rico. Provided local training in Spanish.
-

## EDUCATION

### **Ed. D., Evaluation, University of Louisville, Louisville, Kentucky, 1992.**

Graduate study focused in the areas of exceptionally effective schools, social and political interactions with education, survey research, and statistical modeling. Dissertation title: *Causal Path Analysis of Effective School Variables*. Served as graduate assistant in the Department Foundations of Education assisting in faculty research and classroom instruction. Completed post-graduate course in Hierarchical Linear Modeling at the University of Maryland, 2001 under Dr. Robert Croninger.

### **M. A., History, University of North Carolina at Greensboro, North Carolina, 1976.**

Major areas of inquiry included Native American acculturation and conflict, anti-evolutionary rhetoric, and the colonial period in North American history.

### **B. A., Psychology, University of North Carolina at Chapel Hill, North Carolina, 1972.**

Degree in psychology emphasized the study of child development and operant conditioning. Worked as a research assistant in early childhood social research, 1971-72. Received North Carolina Science Foundation Grant for the study of conditioned responses of rats to alternative reward stimuli in 1971. Also studied intensively in anthropology and worked for North Carolina Department of History and Archives as field archaeologist during 1970.

---

## Publications and Papers (Selected) 2015-1989

Yelton, B. T. & Meyers, A. (2015). *Supporting, Coaching and Informing Alternative Certification Teachers Through Social Media*. Paper presented at the National Association for Alternative Certification Conference, Chicago, IL.

Yelton, B. (2013). *Sheltered Instruction Observation Protocol (SIOP) Implementation in CMS: A Case Study*. Charlotte, NC: BYC Consulting.

Yelton, B. & Stranges, D. (2013). And the Children in the Apple Tree: Further Findings From The Longitudinal Study of Early Education. *A paper presented at the National Smart Start Annual Conference*, Greensboro, NC.

Yelton, B., Meyers, A., & Bullock, A. (2012). *Supporting Lateral Entry Teachers Through Mentoring*. A paper presented at the National Association for Alternative Certification Annual Conference, Washington, DC.

Yelton, B., Stranges, D., & Richardson, M. (2012). *Kindergarten Transition and Elementary School Achievement*. A paper presented at the SC Association for the Education of Young Children Annual Meeting, Columbia, SC.

Bruce Thomas Yelton

Yelton, B. T., Conroy, A. (2011). *Learning from Evaluation: Arabic Language Classes in Public Schools*. Paper presented at the World View Global Education Symposium, University of North Carolina at Chapel Yelton.

Yelton, B. T., Plonski, P., Minick, R., & Rasberry, M. (2009). *Interviews, Assessments and Evidence Used to Evaluate "Ready Schools"*. Paper presented at the National Smart Start Conference, Greensboro, NC.

Yelton, B. T., Plonski, P., Morgan, G. & Gilbert, M. (2007). *The Long Road of Longitudinal Studies*. Paper presented at the American Evaluation Association Annual Conference, Baltimore, MD.

Yelton, B. T., Plonski, P., & Morgan, G. (2006). What Makes You Think You're So Great? Creating An Organizational Model for CTP Success. *Connections, 16*(5).

Yelton, B. T., Plonski, P. & Miller, S. (2005) *Measuring Student Motivation and Sense of efficacy in a Middle College Evaluation Project*. Paper presented at the American Evaluation Association Annual Conference, Toronto, ON.

Yelton, B. T. & Plonski, P. (2004). *Using Appreciative Inquiry as Process Evaluation*. Paper presented at the American Evaluation Association Annual Conference, Atlanta, GA.

Plonski, P. & Yelton, B. T. (2004). Capturing Participants and Programs. *Family Literacy Forum, 10*(2), 34-37.

Yelton, B. T., Miller, S. K., & Ruscoe, G. C. (1994, April). *The Stability of School Effectiveness: Comparative Path Models*. Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans, LA.

Love, J. M., & Yelton, B. T. (1989). Smoothing the Road From Preschool to Kindergarten. *Principal, 68*(5), 26-27.

---

## CONSULTING (Selected) 1996-2015

### **Early Childhood Programs**

Responsible for evaluation of early childhood initiatives in North and South Carolina ("Smart Start" and "First Steps"). Evaluations include programs to improve the quality of child care, children's health, board function and family services. Projects include:

- Outcome evaluation of the North Carolina *Even Start* program for at-risk 3 and 4 year-old's and their parents.
- Longitudinal program effectiveness studies in four North Carolina county and regional *Smart Start* (early childhood) programs.
- Evaluator for the Kellogg Foundation's *SPARK* project in North Carolina (a five-year, \$4 million early childhood project).

Bruce Thomas Yelton

**Assessment/Alternative Assessment**

Participated in:

- Curriculum alignment for special needs student in Nevada (2009-2010).
- Alternate assessment for special needs students in Montana (2010).
- A standard setting study by the state of Pennsylvania for early childhood authentic assessment (2012).
- A four state consortium implementing the federally funded project “Longitudinal Examination of Alternate Assessment Progressions” (LEAAP) 2010-2013.

**Language Programs**

Participated in the evaluation of two language “dual immersion” programs in the Charlotte-Mecklenburg Schools (Japanese-English, Spanish-English) over a period of three years. Involved in the evaluation of the Sheltered Instruction Observation Protocol (SIOP) and Expecting Comprehension from English Language Learners (ExC-ELL) programs in the Charlotte-Mecklenburg Schools as well as Title III, and Arabic Foreign Language Assistance Program (FLAP) evaluations.

**Teacher Preparation Programs**

Served as the evaluator for NC TEACH II (2007-11) and NC INSPIRE (2011-Current). These are federal Transition to Teaching grants implemented statewide in North Carolina by University of North Carolina General Administration and the Center for School Leadership Development for the purpose of recruiting and supporting lateral entry teachers in high need subject areas for high need schools.

**Other Consulting**

Other work includes:

- Regional federal technical assistance provider for Title I programs for the Northeast and Puerto Rico with a focus on effective data disaggregation.
- Supervision of Magnet School evaluation services to two large urban LEAs from 1997 through 2010. Evaluation services included magnet theme implementation, impact on student achievement, impact on integration, and family perceptions.

---

**OTHER**

Evaluation reviewer for US Department of Education Innovation in Education (i3) grants (2013-16), Arts Educators grants (2014).

Reviewer for the Journal of the National Association for Alternative Certification (JNAAC).

Member of: The American Evaluation Association.  
The North Carolina Association for Research in Education  
The Mecklenburg Evaluators Group

Former Resident of Buenos Aires, Argentina. Worked in the Commonwealth of Puerto Rico for three years providing on-site technical assistance. Conversant in Spanish.



Karen B. Salmon, Ph.D.  
State Superintendent of Schools

200 West Baltimore Street • Baltimore, MD 21201 • 410-767-0100 • 410-333-6442 TTY/TDD • marylandpublicschools.org

September 21, 2016

Patrick Rooney, Acting Director  
U.S. Department of Education  
Office of Elementary and Secondary Education  
Office of State Support  
Washington, D.C. 20202-6200

Dear Director Rooney:

The Maryland State Department of Education (MSDE) submits this Enhanced Assessment Grant Application, *Innovations in Science Map, Assessment, and Report Technologies (I-SMART)*, on behalf of a consortium of states that also includes New Jersey, New York, and Oklahoma. Members of the consortium have agreed to:

1. Participate in a project advisory committee to guide the activities associated with each goal.
2. Recruit educators to participate in phases of the project such as learning map review, item writing, and external testlet review.
3. Recruit experts within their states who have specialized expertise to provide guidance on specific issues (e.g., specialists in accessibility for students who have Visual Impairments and significant cognitive disabilities).
4. Recruit sites to participate in research and evaluation phases of the project (e.g., testlet tryouts, dashboard usability study).
5. Assist with dissemination efforts.

MSDE will serve as the lead state and fiscal agent for I-SMART. Upon funding, MSDE will secure a Memorandum of Understanding that serves as a binding agreement between MSDE and each state in the consortium. MSDE also commits to the following:

1. Oversee project activities to be implemented by the University of Kansas and its subaward organizations.
2. Provide two staff members to serve on the Project Governance Board. The Project Director, Ms. Torchon will chair the Project Governance Board.
3. Submit annual performance reports and the final performance report to the U.S. Department of Education (USDE).
4. Meet the requirements published in the Federal Register on April 19, 2011 (76 FR 21985) (2011 NFP), as described in the Request for Applications for the FY2016 Application for New Grants under the Enhanced Assessment Instruments Grant Program (EAG; pp. 60-62).

Letters of commitment from each collaborating state are provided in Part 6 of this application.

Respectfully submitted on behalf of the Consortium,

Karen B. Salmon, Ph.D.  
State Superintendent of Schools

KBS:mrs

PR/Award # S368A170009

Page e151



Jack R. Smith, Ph.D.  
Interim State Superintendent of Schools

200 West Baltimore Street • Baltimore, MD 21201 • 410-767-0100 • 410-333-6442 TTY/TDD • [msde.maryland.gov](http://msde.maryland.gov)

December 8, 2015

U. S. Department of Education  
OCFO/FIPAO/ICG  
Attn: Frances Outland  
550 12<sup>th</sup> Street, S.W.  
Washington, DC 20202-4450

Dear Ms. Outland:

Enclosed please find the countersigned original Indirect Cost Rate Agreement, reflecting the approved Indirect Cost Rates for fiscal year 2016. Additionally, I have enclosed the countersigned approval for a one-year extension to Maryland's delegated authority for calculation and approval of the local school system indirect cost rates.

Thank you very much for your assistance in resolving the FY 2016 rates and for the one-year extension to our delegated authority.

Please let me know if I can be of further assistance. I may be reached at 410-767-0011 or [kristy.michel@maryland.gov](mailto:kristy.michel@maryland.gov).

Sincerely,

Kristy Michel  
Chief Operating Officer

KM/km

Enclosures

C: Emily Wen

**INDIRECT COST RATE AGREEMENT  
STATE EDUCATION AGENCY**

**Organization**

Maryland State Department of Education  
200 West Baltimore Street  
Baltimore, MD 21201

**Date:** DEC 0 2 2015

**Agreement No:** 2015-136

**Filing Reference:** Replaces previous Agreement No. 2014-184

**Dated:** 2/6/2015

The approved indirect cost rates herein are for use on grants, contracts, and other agreements with the Federal Government. The rates are subject to the conditions included in Section II of this Agreement and regulations issued by the Office of Management and Budget (OMB) Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards under 2 CFR 200.

**Section I - Rates and Bases**

<u>Type</u>	<u>From</u>	<u>To</u>	<u>Rate</u>	<u>Base</u>	<u>Applicable To</u>
Fixed	07/01/2015	06/30/2016	15.2%	MTDC	Unrestricted
Fixed	07/01/2015	06/30/2016	13.5%	MTDC	Restricted
Fixed	07/01/2015	06/30/2016	16.0%	MTDC	DDS

**Distribution Base:**

**MTDC** Modified Total Direct Cost - Total direct costs excluding equipment, capital expenditures, participant support costs, patient care, pass-through funds and the portion of each subaward (subcontract or subgrant) above \$25,000 (each award; each year).

**Applicable To:**

**Unrestricted** Unrestricted rates apply to programs that do not require a restricted rate per 34 CFR 75.563 and 34 CFR 76.563.

**Restricted** Restricted rates apply to programs that require a restricted rate per 34 CFR 75.563 and 34 CFR 76.563.

**Treatment of Fringe Benefits:**

Fringe benefits applicable to direct salaries and wages are treated as direct costs. Pursuant to 2 CFR 200.431, (b), (3), Paragraph (i), unused leave costs for all employees are allowable in the year of payment. The treatment of unused leave costs should be allocated as an indirect cost except for those employee salaries designated as a direct cost for the restricted rate calculation.

**Capitalization Policy:** Items of equipment are capitalized and depreciated if the initial acquisition cost is equal to or greater than \$5,000.

## **Section II – Particulars**

**Limitations:** Application of the rates contained in this Agreement is subject to all statutory or administrative limitations on the use of funds, and payments of costs hereunder are subject to the availability of appropriations applicable to a given grant or contract. Acceptance of the rates agreed to herein is predicated on the following conditions: (A) that no costs other than those incurred by the Organization were included in the indirect cost pools as finally accepted, and that such costs are legal obligations of the Organization and allowable under the governing cost principles; (B) the same costs that have been treated as indirect costs are not claimed as direct costs; (C) that similar types of information which are provided by the Organization, and which were used as a basis for acceptance of rates agreed to herein, are not subsequently found to be materially incomplete or inaccurate; and (D) that similar types of costs have been accorded consistent accounting treatment.

**Accounting Changes:** The rates contained in this agreement are based on the organizational structure and the accounting systems in effect at the time the proposal was submitted. Changes in organizational structure or changes in the method of accounting for costs which affect the amount of reimbursement resulting from use of the rates in this agreement, require the prior approval of the responsible negotiation agency. Failure to obtain such approval may result in subsequent audit disallowance.

**Provisional/Final/Predetermined Rates:** A proposal to establish a final rate must be submitted. The awarding office should be notified if the final rate is different from the provisional rate so that appropriate adjustments to billings and charges may be made. Predetermined rates are not subject to adjustment.

**Fixed Rate:** The negotiated fixed rate is based on an estimate of the costs that will be incurred during the period to which the rate applies. When the actual costs for such period have been determined, an adjustment will be made to a subsequent rate calculation to compensate for the difference between the costs used to establish the fixed rate and the actual costs.

**Notification to Other Federal Agencies:** Copies of this document may be provided to other Federal agencies as a means of notifying them of the agreement contained herein.

**Audit:** All costs (direct and indirect, federal and non-federal) are subject to audit. Adjustments to amounts resulting from audit of the cost allocation plan or indirect cost rate proposal upon which the negotiation of this agreement was based may be compensated for in a subsequent negotiation.

**Reimbursement Ceilings/Limitations on Rates:** Awards that include ceiling provisions and statutory/regulatory requirements on indirect cost rates or reimbursement amounts are subject to the stipulations in the grant or contract agreements. If a ceiling is higher than the negotiated rate in Section I of this agreement, the negotiated rate will be used to determine the maximum allowable indirect cost.

**Section III - Special Remarks**

Alternative Reimbursement Methods: If any federal programs are reimbursing indirect costs by a methodology other than the approved rates in this agreement, such costs should be credited to the programs and the approved rates should be used to identify the maximum amount of indirect costs allocable.

Submission of Proposals: New indirect cost proposals are necessary to obtain approved indirect cost rates for future fiscal years. **The next indirect cost rate proposal is due six months prior to the expiration dates of the rates in this agreement.**

**Section IV - Approvals**

For the State Education Agency:

Maryland State Department of Education  
200 West Baltimore Street  
Baltimore, MD 21201

Kristy Michel  
Signature

Kristy Michel  
Name

Deputy Superintendent  
Title

12/8/15  
Date

For the Federal Government:

U.S. Department of Education  
OCFO / FIO / ICG  
550 12th Street, SW  
Washington, DC 20202-4450

Frances Outland  
Signature

Frances Outland  
Name

Director, Indirect Cost Group  
Title

DEC 02 2015  
Date

Negotiator: Emily Wen  
Telephone Number: (202) 245-8109

LOCAL EDUCATIONAL AGENCY  
DELEGATION AGREEMENT

ORGANIZATION:

Maryland State Department of Education  
200 West Baltimore Street  
Baltimore, MD 21201

DATE: DEC 0 2 2015

AGREEMENT NO. 2011-143 (A)

FILING REFERENCE: This replaces  
previous Agreement No.2011-143  
dated May 6, 2011

This Agreement confirms approval and acceptance of the methodology policy and procedures the State Educational Agency (SEA) will use in establishing indirect cost rates for their Local Educational Agencies (LEAs). These rates are for use in the award and management of Federal contracts, grants and other assistance arrangements governed by Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards 2 CFR part 200 and Education Department General Administrative Regulations (EDGAR) 34 CFR parts 75.561 and 76.561 (b) and (c).

The State Superintendent of Education or designated representative is delegated authority to establish indirect cost rates for LEAs in their State. These LEA rates will serve as the sole basis for budgeting and allocating indirect cost reimbursement under Federal programs. The application of LEA indirect cost rates is binding on all Federal agencies and subject to periodic review pursuant to single audit requirements for State and Local governments.

The effective period of this agreement is: July 1, 2015 – June 30, 2016.

For the State Educational Agency:

Kristy Michel  
Signature  
Kristy Michel  
Name  
Deputy Superintendent  
Title  
12/8/15  
Date

For the Federal Government:

Frances Outland  
Signature  
Frances Outland  
Name  
Director, Indirect Cost Group  
Title  
DEC 0 2 2015  
Date  
Emily Wen  
Negotiator  
202-245-8109  
Telephone Number

**COLLEGES AND UNIVERSITIES RATE AGREEMENT**

EIN: 1486029925D1

DATE:03/22/2016

ORGANIZATION:

FILING REF.: The preceding agreement was dated 03/01/2012

University of Kansas  
238 Carruth O'Leary Hall  
P.O. Box 587  
Lawrence, KS 66044-0587

The rates approved in this agreement are for use on grants, contracts and other agreements with the Federal Government, subject to the conditions in Section III.

**SECTION I: Facilities And Administrative Cost Rates**

RATE TYPES:      FIXED                      FINAL                      PROV. (PROVISIONAL)                      PRED. (PREDETERMINED)

EFFECTIVE PERIOD

<u>TYPE</u>	<u>FROM</u>	<u>TO</u>	<u>RATE (%)</u>	<u>LOCATION</u>	<u>APPLICABLE TO</u>
PRED.	07/01/2015	06/30/2016	50.00	On Campus	Organized Research
PRED.	07/01/2016	06/30/2019	51.50	On Campus	Organized Research
PRED.	07/01/2015	06/30/2019	50.00	On Campus	Instruction
PRED.	07/01/2015	06/30/2016	33.00	On Campus	Other Sponsored Activities
PRED.	07/01/2016	06/30/2019	34.00	On Campus	Other Sponsored Activities
PRED.	07/01/2015	06/30/2019	26.00	Off Campus	All Programs
PROV.	07/01/2019	Until Amended		Use the same rates and conditions as those cited for FYE 6/30/2019.	All Programs

ORGANIZATION: University of Kansas

AGREEMENT DATE: 3/22/2016

---

\*BASE

Modified total direct costs, consisting of all direct salaries and wages, applicable fringe benefits, materials and supplies, services, travel and up to the first \$25,000 of each subaward (regardless of the period of performance of the subawards under the award). Modified total direct costs shall exclude equipment, capital expenditures, charges for patient care, rental costs, tuition remission, scholarships and fellowships, participant support costs and the portion of each subaward in excess of \$25,000. Other items may only be excluded when necessary to avoid a serious inequity in the distribution of indirect costs, and with the approval of the cognizant agency for indirect costs.

ORGANIZATION: University of Kansas

AGREEMENT DATE: 3/22/2016

---

---

**SECTION II: SPECIAL REMARKS**

---

TREATMENT OF FRINGE BENEFITS:

The fringe benefits are specifically identified to each employee and are charged individually as direct costs. The directly claimed fringe benefits are listed below.

TREATMENT OF PAID ABSENCES

Vacation, holiday, sick leave pay and other paid absences are included in salaries and wages and are claimed on grants, contracts and other agreements as part of the normal cost for salaries and wages. Separate claims are not made for the cost of these paid absences.

OFF-CAMPUS DEFINITION: For all activities performed in facilities not owned by the institution and to which rent is directly allocated to the project(s) the off-campus rate will apply. Grants or contracts will not be subject to more than one F&A cost rate. If more than 50% of a project is performed off-campus, the off-campus rate will apply to the entire project.

EQUIPMENT DEFINITION:

Equipment means an article of nonexpendable, tangible personal property having a useful life of more than one year and an acquisition cost of \$5,000 or more per unit.

FRINGE BENEFITS:

FICA	Retirement
Disability Insurance	Worker's Compensation
Life Insurance	Unemployment Insurance
Health Insurance	Leave Payment Reserve
Kan Elect	

The above listed rates are also applicable to the University of Kansas Centers for Research, Inc. (EIN 48-0680117)

Next proposal based on actual cost for FYE 6/30/2018 is due in our office by 12/31/2018.

ORGANIZATION: University of Kansas

AGREEMENT DATE: 3/22/2016

**SECTION III: GENERAL**

**A. LIMITATIONS:**

The rates in this Agreement are subject to any statutory or administrative limitations and apply to a given grant, contract or other agreement only to the extent that funds are available. Acceptance of the rates is subject to the following conditions: (1) Only costs incurred by the organization were included in its facilities and administrative cost pools as finally accepted; such costs are legal obligations of the organization and are allowable under the governing cost principles; (2) The same costs that have been treated as facilities and administrative costs are not claimed as direct costs; (3) Similar types of costs have been accorded consistent accounting treatment; and (4) The information provided by the organization which was used to establish the rates is not later found to be materially incomplete or inaccurate by the Federal Government. In such situations the rate(s) would be subject to renegotiation at the discretion of the Federal Government.

**B. ACCOUNTING CHANGES:**

This Agreement is based on the accounting system purported by the organization to be in effect during the Agreement period. Changes to the method of accounting for costs which affect the amount of reimbursement resulting from the use of this Agreement require prior approval of the authorized representative of the cognizant agency. Such changes include, but are not limited to, changes in the charging of a particular type of cost from facilities and administrative to direct. Failure to obtain approval may result in cost disallowances.

**C. FIXED RATES:**

If a fixed rate is in this Agreement, it is based on an estimate of the costs for the period covered by the rate. When the actual costs for this period are determined, an adjustment will be made to a rate of a future year(s) to compensate for the difference between the costs used to establish the fixed rate and actual costs.

**D. USE BY OTHER FEDERAL AGENCIES:**

The rates in this Agreement were approved in accordance with the authority in Title 2 of the Code of Federal Regulations, Part 200 (2 CFR 200), and should be applied to grants, contracts and other agreements covered by 2 CFR 200, subject to any limitations in A above. The organization may provide copies of the Agreement to other Federal Agencies to give them early notification of the Agreement.

**E. OTHER:**

If any Federal contract, grant or other agreement is reimbursing facilities and administrative costs by a means other than the approved rate(s) in this Agreement, the organization should (1) credit such costs to the affected programs, and (2) apply the approved rate(s) to the appropriate base to identify the proper amount of facilities and administrative costs allocable to these programs.

BY THE INSTITUTION:

University of Kansas

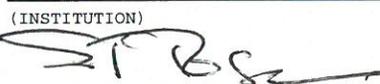
(INSTITUTION)

(SIGNATURE)

(NAME)

(TITLE)

(DATE)

  
S.T. Rosen  
Interim Provost  
4-01-2016

ON BEHALF OF THE FEDERAL GOVERNMENT:

DEPARTMENT OF HEALTH AND HUMAN SERVICES

(AGENCY)

**Arif M. Karim -S** Digitally signed by Arif M. Karim -S  
DN: cn=US, ou=U.S. Government, ou=HHS, ou=PSC, ou=People,  
c=Arif M. Karim -S, o=9.2342.19200300.100.1.1=2000212895  
Date: 2016.03.30 09:12:19 -0500

(SIGNATURE)

Arif Karim

(NAME)

Director, Cost Allocation Services

(TITLE)

3/22/2016

(DATE) 7049

HHS REPRESENTATIVE:

Narendra Gandhi

Telephone:

(214) 767-3261

**COMPONENTS OF THE PUBLISHED FACILITIES & ADMINISTRATIVE COST RATE**

INSTITUTION:

University of Kansas

FY COVERED BY RATE:

July 1, 2015 through June 30, 2019

Period Covered:

RATE TYPE:

RATE COMPONENTS:

- Building Depreciation
- Equipment Depreciation
- Interest
- Operations & Maintenance
- Library
- Administrative Component
- F&A Rate

	7/1/2015 - 6/30/2016		7/1/2016 - 6/30/2019		7/1/2015 6/30/2019		
	ORGANIZED RESEARCH		ORGANIZED RESEARCH		INSTRUCTION		
	On-Camp	Off-Camp	On-Camp	Off-Camp	On-Camp	Off-Camp	
Building Depreciation	4.9		5.5		4.9	1.3	
Equipment Depreciation	4.2		4.2		4.2	0.2	
Interest	1.6		2.2		1.6	0.1	
Operations & Maintenance	11.4		11.7		11.4	4.6	
Library	1.9		1.9		1.9	1.8	
Administrative Component	26.0	26.0	26.0	26.0	26.0	26.0	
F&A Rate	50.0	26.0	51.5	26.0	50.0	34.0	
							26.0

CONCURRENCE:

University of Kansas

(Institution)

(Signature)



(Name)

(Title)

(Date)

INDIRECT COST RATE AGREEMENT  
NONPROFIT ORGANIZATION

**Organization**

CAST, Inc.  
40 Harvard Mills Square, Suite 3  
Wakefield, MA 01880-3233

**Date:** May 3, 2016

**Agreement No:** 2016-141

**Filing Reference:** Replaces previous  
Agreement No. 2015-153

**Dated:** 9/30/2015

The approved indirect cost rates herein are for use on grants, contracts, and other agreements with the Federal Government. The rates are subject to the conditions included in Section II of this Agreement and regulations issued by the Office of Management and Budget (OMB) Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards under 2 CFR 200.

**Section I - Rates and Bases**

<u>Type</u>	<u>From</u>	<u>To</u>	<u>Rate</u>	<u>Base</u>	<u>Applicable To</u>
Final	10/01/2014	09/30/2015	44.0%	SWF	All Programs
Provisional	10/01/2015	09/30/2016	42.2%	SWF	All Programs
Provisional	10/01/2016	09/30/2017	44.0%	SWF	All Programs

**Distribution Base:**

SWF            Total Direct Salaries & Wages including all applicable fringe benefits.

**Applicable To:**

All Programs    The rates herein are applicable to All Programs.

**Treatment of Fringe Benefits:**

Fringe benefits applicable to salaries and wages are treated appropriately as direct or indirect costs. Vacation, holiday, sick leave and other paid absences are included in salaries claimed on awards. Separate claims for paid absences are not made.

**Capitalization Policy:** Items of equipment are capitalized and depreciated if the initial acquisition cost is equal to or greater than \$1,000.

## **Section II – Particulars**

**Limitations:** Application of the rates contained in this Agreement is subject to all statutory or administrative limitations on the use of funds, and payments of costs hereunder are subject to the availability of appropriations applicable to a given grant or contract. Acceptance of the rates agreed to herein is predicated on the following conditions: (A) that no costs other than those incurred by the Organization were included in the indirect cost pools as finally accepted, and that such costs are legal obligations of the Organization and allowable under the governing cost principles; (B) the same costs that have been treated as indirect costs are not claimed as direct costs; (C) that similar types of information which are provided by the Organization, and which were used as a basis for acceptance of rates agreed to herein, are not subsequently found to be materially incomplete or inaccurate; and (D) that similar types of costs have been accorded consistent accounting treatment.

**Accounting Changes:** The rates contained in this agreement are based on the organizational structure and the accounting systems in effect at the time the proposal was submitted. Changes in organizational structure or changes in the method of accounting for costs which affect the amount of reimbursement resulting from use of the rates in this agreement, require the prior approval of the responsible negotiation agency. Failure to obtain such approval may result in subsequent audit disallowance.

**Provisional/Final/Predetermined Rates:** A proposal to establish a final rate must be submitted. The awarding office should be notified if the final rate is different from the provisional rate so that appropriate adjustments to billings and charges may be made. Predetermined rates are not subject to adjustment.

**Fixed Rate:** The negotiated fixed rate is based on an estimate of the costs that will be incurred during the period to which the rate applies. When the actual costs for such period have been determined, an adjustment will be made to a subsequent rate calculation to compensate for the difference between the costs used to establish the fixed rate and the actual costs.

**Notification to Other Federal Agencies:** Copies of this document may be provided to other Federal agencies as a means of notifying them of the agreement contained herein.

**Audit:** All costs (direct and indirect, federal and non-federal) are subject to audit. Adjustments to amounts resulting from audit of the cost allocation plan or indirect cost rate proposal upon which the negotiation of this agreement was based may be compensated for in a subsequent negotiation.

**Reimbursement Ceilings/Limitations on Rates:** Awards that include ceiling provisions and statutory/regulatory requirements on indirect cost rates or reimbursement amounts are subject to the stipulations in the grant or contract agreements. If a ceiling is higher than the negotiated rate in Section I of this agreement, the negotiated rate will be used to determine the maximum allowable indirect cost.

**Section III - Special Remarks**

Alternative Reimbursement Methods: If any federal programs are reimbursing indirect costs by a methodology other than the approved rates in this agreement, such costs should be credited to the programs and the approved rates should be used to identify the maximum amount of indirect costs allocable.

Submission of Proposals: New indirect cost proposals are necessary to obtain approved indirect cost rates for future fiscal years. **The next indirect cost rate proposal is due six months prior to expiration dates of the rates in this agreement.**

**Section IV - Approvals**

For the Organization:

CAST, Inc.  
40 Harvard Mills Square, Suite 3  
Wakefield, MA 01880-3233

For the Federal Government:

U.S. Department of Education  
OCFO / FIO / ICG  
550 12th Street, SW  
Washington, DC 20202-4450

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

Frances Outland  
\_\_\_\_\_  
Name

Director, Indirect Cost Group  
\_\_\_\_\_  
Title

May 3, 2016  
\_\_\_\_\_  
Date

Negotiator: Catherine Hull  
Telephone Number: (202) 245-7784

September 20, 2016

Douglas Strader, Director of Assessment  
Maryland State Department of Education  
200 W. Baltimore Street  
Baltimore, MD 21201

Dr. Strader,

I am pleased to offer support for the *Innovations in Science Map, Assessment, and Report Technologies (I-SMART)* grant proposal, submitted to the Enhanced Assessment Grants (EAG) Program of the U.S. Department of Education Office of Elementary and Secondary Education. Staff members at the Missouri Department of Elementary and Secondary Education (DESE) have reviewed the project goals and activities and encourage the funding of this application.

*I-SMART* offers the opportunity to collaborate on development and implementation of new ways to maximize science achievement across grades. Missouri is an enthusiastic partner to the University of Kansas, Dynamic Learning Maps and other *I-SMART* member states in this effort to promote enhanced access to science content for students with significant cognitive disabilities. This project offers application of innovative approaches to science instruction, assessment and reporting, while driving continuous improvement in science instruction for all students. Furthermore, development of science learning maps will provide ancillary benefits applicable to cross-content skill clusters.

As a partner in this project, we will serve on the project's governance committee, provide leadership, and vet strategies associated with project goals. We will recruit educator participants and suggest sites for learning map review, item writing, testlet review, pilot testing and other activities. Additionally, we will disseminate project findings and resources that support science instruction and assessment.

We look forward to collaborating with you and the other member states on *I-SMART*.

Sincerely,



Lisa Sireno  
Standards and Assessment Administrator

cc: Shaun Bates  
Blaine Henningsen



**State of New Jersey**  
DEPARTMENT OF EDUCATION  
PO Box 500  
TRENTON, NJ 08625-0500

**CHRIS CHRISTIE**  
*Governor*

**KIM GUADAGNO**  
*Lt. Governor*

**DAVID C. HESPE**  
*Commissioner*

September 12, 2016

Dr. Douglas Strader  
Director of Assessment  
Maryland State Department of Education  
200 W. Baltimore Street  
Baltimore, MD 21201

Dear Dr. Strader:

On behalf of the state of New Jersey, I offer our collaboration for the *Innovations in Science Map, Assessment, and Report Technologies (I-SMART)* grant proposal, submitted to the Enhanced Assessment Grants (EAG) Program of the U.S. Department of Education Office of Elementary and Secondary Education. Staff members from the Office of Assessments have reviewed the project goals and activities and we strongly support the funding of this application.

We are delighted for the opportunity to collaborate with you to develop and implement new ways to maximize science achievement and progress across grades. Our staff are looking forward to the planning, development, and review of the most appropriate way to assess students with the most intellectual disabilities on the Next Generation Science Standards (NGSS). The exploration and evaluation of the use and reliability of specific item types to ensure accurate and valid accountability results is our primary goal; participation in this grant will benefit our students and testing program.

As partners in this project, we will designate state education agency staff to serve on the project's governance committee and provide leadership on the activities associated with each goal. We will also actively recruit educators and sites for activities such as learning map review, item writing, testlet review, and pilot testing. We will disseminate project findings and products to support science instruction and assessment within our state.

We are pleased to have this opportunity to partner with you, other states, and other collaborating organizations on this project.

If you should have any questions or concern, please feel free to contact me, at (609) 984-7761 or [jeffrey.hauger@doe.state.nj.us](mailto:jeffrey.hauger@doe.state.nj.us).

Sincerely,



Jeffrey B. Hauger, Ed.D., Director  
Office of Assessments  
Division of Talent and Performance

JBH/EC/ltr:dstrader/Maryland

c: Peter Shulman  
Donald Mitchell  
Kevin Dehmer



DIRECTOR  
Office of State Assessment

September 13, 2016

Douglas Strader, Director of Assessment  
Maryland State Department of Education  
200 W. Baltimore Street  
Baltimore, MD 21201

Dear Dr. Strader:

On behalf of the State of New York, I offer our collaboration for the *Innovations in Accessible Learning Maps, Assessments, and Reports in Science* grant proposal, submitted to the Enhanced Assessment Grants (EAG) Program of the U.S. Department of Education Office of Elementary and Secondary Education. Staff members from the Office of State Assessment have reviewed the project goals and activities and we support the funding of this application.

We are interested in the opportunity to collaborate with you to develop and implement new ways to maximize science achievement and progress across grades. Our State is in the process of adopting high-quality standards to advance science education in New York State and provide pathways into the fields of science, technology, engineering, and mathematics. We strive to provide high-quality assessments that will measure student learning of more rigorous, multidimensional standards, while providing timely and useful feedback to school and parents about student performance. Our ultimate goal is to maximize science achievement for students with significant cognitive disabilities, who are assessed on the New York State Alternate Assessment in the area of Science.

As partners in this project, we will designate state education agency staff to serve on the project's governance committee to the extent practicable and provide leadership on the activities associated with each goal. We will also actively recruit educators and sites for activities such as learning map review, item writing, testlet review, and pilot testing. We will disseminate project findings to support science instruction and assessment within our state.

We are pleased to have this opportunity to partner with you, other states, and other collaborating organizations on this project.

Sincerely,

Steven E. Katz



JOY HOFMEISTER

STATE SUPERINTENDENT OF PUBLIC INSTRUCTION  
OKLAHOMA STATE DEPARTMENT OF EDUCATION

September 14, 2016

Douglas Strader, Director of Assessment  
Maryland State Department of Education  
200 W. Baltimore Street  
Baltimore, MD 21201

Douglas Strader:

On behalf of the State of Oklahoma, I offer our collaboration for the Innovations in Science Map, Assessment, and Report Technologies (I-SMART) grant proposal, submitted to the Enhanced Assessment Grants (EAG) Program of the U.S. Department of Education Office of Elementary and Secondary Education. Staff members from the Oklahoma State Department of Education – Special Education Services department have reviewed the project goals and activities and we strongly support the funding of this application.

As partners in this project, we will designate state education agency staff to serve on the project's governance committee and provide leadership on the activities associated with each goal. We will also actively recruit educators and sites for activities such as learning map review, item writing, testlet review, and pilot testing. We will disseminate project findings and products to support science instruction and assessment within our state.

We are pleased to have this opportunity to partner with you, other states, and other collaborating organizations on this project.

Sincerely,

A handwritten signature in cursive script that reads "Christie Stephenson".

Christie Stephenson

September 22, 2016

Douglas A. Strader, Ed. D.  
Director of Assessment  
Maryland State Department of Education  
200 W. Baltimore St.  
Baltimore, MD 21202

Dear Dr. Strader,

The University of Kansas Center for Research, Inc. has reviewed and approved the proposal entitled “Innovations in Science Map, Assessment, and Reprint Technologies (I-SMART)” submitted under the direction of Dr. Meagan Karvonen to Maryland State Department of Education. It is our understanding that Maryland State Department of Education will submit a proposal to U.S. Department of Education Office of Elementary and Secondary Education. The approved budget reflects a total request of \$3,821,151 for the project duration of 01/01/2017 to 12/31/2020.

The University of Kansas Center for Research, Inc. is a non-profit organization affiliated with the University of Kansas, and handles the administrative and financial functions of grants for the university. Should this proposal result in an award, please direct all payments to the following address:

University of Kansas Center for Research, Inc.  
Accounting Services  
2385 Irving Hill Road  
Lawrence, KS 66045-7568

EIN: 48-0680117

Please contact our office if you need any additional information. Thank you for your attention to this matter.

Sincerely,

  
Alicia M. Reed

Interim Director, Research Administration

September 20, 2016

Douglas Strader, Director of Assessment  
Maryland State Department of Education  
200 W. Baltimore Street  
Baltimore, MD 21201

Douglas Strader:

I am pleased to write this letter of commitment on behalf of the Center for Educational Testing and Evaluation (CETE) at the University of Kansas for *Innovations in Science Map, Assessment, and Report Technologies (I-SMART)* grant proposal, submitted to the Enhanced Assessment Grants (EAG) Program of the U.S. Department of Education Office of Elementary and Secondary Education.

For this project, I will serve as the Principal Investigator responsible for KU's subcontract totaling \$3,784,455. Under this agreement, I will provide oversight for the teams working on each goal to ensure the objectives are completed. KU responsibilities are as follow:

1. Goal 1: Lead the development and evaluation of a learning map model for science.
  - a. Conduct a literature review and develop a learning map model.
  - b. Evaluate the learning map model through expert review and empirical analysis.
2. Goal 2: Design, develop, and evaluate assessments in highly engaging, universally designed, technology delivered formats.
  - a. Collaborate to develop testlet framework.
  - b. Collaborate to develop research protocols.
  - c. Create Essential Element Concept Maps and prototype testlets.
  - d. Develop testlets and prepare them for administration.
  - e. Pilot test and evaluate new testlets for reliability, validity, and fairness.
3. Goal 3: Design, develop, and evaluate a dashboard that provides feedback about student performance on science assessments.
  - a. Collaborate to develop research protocols.
  - b. Collect data on dashboard usability and interpretability.
  - c. Develop software to deliver student results.
4. Goal 4: Broadly disseminate project materials and findings to a variety of audiences.
  - a. Develop and oversee the dissemination plan.
  - b. Maintain the project website.

I will also be responsible for the following tasks related to overall project management:

5. Serve as primary contact with the Maryland State Department of Education for purposes of project management, budgeting, and reporting.
6. Administer the budget for the KU subcontract.
7. Administer contracts with CAST and BYC Consulting.
8. Supervise KU staff assigned to the project.
9. Convene the Project Governance Board as scheduled.
10. Monitor the project implementation timeline, in collaboration with the project leadership team.
11. Oversee the project's external evaluation.
12. Prepare information for annual and final performance reports.
13. Facilitate online and on-site project meetings.

I look forward to collaborating with the Maryland State Department of Education on this project.

Sincerely,



Meagan Karvonen, Ph.D.  
Associate Director

September 15, 2016

Douglas A. Strader, Ed.D.  
Director of Assessment  
Maryland State Department of Education  
200 W. Baltimore St.  
Baltimore, MD 21202

Dear Dr. Strader:

CAST is delighted to collaborate with the Maryland State Department of Education, the University of Kansas and a consortium of states on the proposed Enhanced Assessment Instruments project being submitted for consideration to the Office of Elementary and Secondary Education (CFDA 84.368A) competition should it be awarded funding. The goal of the proposed research and development project, *Innovations in Science Map, Assessment, and Report Technologies (I-SMART)*, is to iteratively create, pilot, evaluate and prepare for widespread dissemination innovative new interactive digital assessments and an accompanying reporting system in science for students with significant cognitive disabilities incorporating the principles of Universal Design for Learning as a means to improve the quality of assessment instruments and systems used by states to measure the science achievement of elementary and secondary school students. This project's unique interweaving of the learning map model with the principles of UDL will facilitate design of high-quality, valid, and reliable innovative items that provide teachers with relevant, actionable information about the science performance of students with significant cognitive disabilities.

We hold the University of Kansas' work on Dynamic Learning Maps with high regard and have great respect and admiration for the contributions you have made to the field of assessments for the neediest of children in our country. The proposed project brings together a stellar interdisciplinary team and approach to "move the needle" on assessments in science by incorporating the UDL principles, most particularly the principles around student engagement, into assessment design and delivery.

Under the leadership of CAST Co-Principal Investigator Dr. Jose Blackorby, the CAST team will collaborate on all three goals for the proposed project: 1) develop and evaluate a learning map model for science for students with significant cognitive disabilities from a Universal Design for Learning perspective; 2) design, develop, and evaluate assessments that incorporate science disciplinary content and science and engineering practices in highly engaging, technology-delivered formats consistent with the principles of Universal Design for Learning; and 3) design, develop, and evaluate a dashboard that provides diagnostic feedback based on student performance on science assessments.

CAST is well aware of the potentially large implications of this project and the importance to students with disabilities generally. We believe that CAST's expertise in design based research and our expertise in incorporating UDL within technology implementations will be an extremely valuable addition to this project, and one that would significantly help assure success.

You have assembled a great team to conduct this work and we are pleased to be able to contribute to this area of national significance.

Sincerely,



David Rose, Ed.D.  
Chief Education Officer and Co-Founder

## **Scope of Work –CAST Sub-Award**

*Innovations in Science Map, Assessment, and Report Technologies (I-SMART)  
Maryland State Department of Education*

*Enhanced Assessment Instruments Grant Program; Office of Elementary and Secondary Education*

**Period of Performance:** Jan 1, 2017 – December 31, 2020

**Purpose:** The Maryland State Department of Education in partnership with The University of Kansas, CAST and a consortium of states, propose a research and development project to iteratively create, pilot, evaluate and prepare for widespread dissemination innovative new interactive digital assessments and accompanying reporting system in science for students with significant cognitive disabilities and their teachers, utilizing the principles of Universal Design for Learning.

### **GOALS and TASKS**

- 1. Goal: Collaborate in the development and evaluation of a learning map model for science for students with significant cognitive disabilities from a Universal Design for Learning perspective. Tasks:**
  - Provide advice on the current science neighborhood map models
  - Provide consultation on design decisions for building the maps
  - Partner in the empirical analyses of the map structure
  - Plan on one trip to KU in Year 1 to review map model
  
- 2. Goal: Collaborate in the design, development, and evaluation of assessments that incorporate science disciplinary content and science and engineering practices in highly engaging, technology-delivered formats consistent with the principles of Universal Design for Learning. Tasks:**
  - Collaborate in the reconceptualization of testlet design
  - Lead the iterative design of innovative testlet prototypes utilizing the UDL framework
  - Recruit and administer tryouts of the testlets with users
  - Collaborate with KU in recruitment of schools for pilot testing as needed
  - Lead the evaluation of the testlet prototypes
  - Deliver design package of testlets suitable for programming to KU
  - Partner with KU in the development of technical documentation
  
- 3. Goal: Collaborate in the design, development, and evaluation of a dashboard that provides diagnostic feedback based on student performance on science assessments. Tasks:**
  - Collaborate in the design of the needs assessment with teachers about information to be displayed in a reporting dashboard
  - Using an iterative design process, develop prototypes and collect feedback on the dashboard (including usability and interpretability of score report contents)
  - Deliver final dashboard design package to KU for programming

#### **4. Project Management**

- Attend weekly check-in project management calls
- Each year, attend a project governance board meeting
- As needed, participate in periodic governance board calls
- Contribute to and review the annual report for each project year and final performance report
- Contribute to disseminating findings

## **BYC Consulting**

September 10, 2016

Douglas Strader, Director of Assessment  
Maryland State Department of Education  
200 W. Baltimore Street  
Baltimore, MD 21201

Dear Dr. Strader:

This letter is to inform you that BYC Consulting is committed to serve in the capacity of external evaluator for *Innovations in Science Map, Assessment, and Report Technologies (I-SMART)* grant proposal, submitted by the Maryland Department of Education. This work will be carried out primarily by me and supported by other qualified BYC Consulting research associates as necessary.

Sincerely,

A handwritten signature in black ink, appearing to read "B. Yelton", with a long horizontal stroke extending to the right.

Bruce Yelton  
Chief Operations Officer



*In collaboration with:*

Council of Chief State School Officers (CCSSO)

National Association of State Directors of Special Education (NASDSE)

September 15, 2016

Douglas Strader  
Director of Assessment  
Maryland State Department of Education  
200 W. Baltimore Street  
Baltimore, MD 21201

Douglas Strader:

On behalf of the National Center on Educational Outcomes (NCEO), I offer our collaboration for the *Innovations in Science Map, Assessment, and Report Technologies (I-SMART)* grant proposal, submitted to the Enhanced Assessment Grants (EAG) Program of the U.S. Department of Education Office of Elementary and Secondary Education.

As you know, NCEO's website serves as a technical assistance and dissemination hub on assessment issues, especially for students with disabilities, English learners, and English learners with disabilities. In the past 5 years NCEO's website had nearly 1 million page views made by 368,660 users in 457,778 sessions; 11,451 PDFs of NCEO and partner reports were downloaded. NCEO will assist with the dissemination of I-SMART project findings and products to support science assessment and instruction for students with disabilities.

We are pleased to have this opportunity to support the project.

Sincerely,

A handwritten signature in black ink that reads "Martha Thurlow". The signature is written in a cursive, flowing style.

Martha Thurlow, Ph.D.  
Director



**The Center for Literacy and Disability Studies**  
University of North Carolina at Chapel Hill  
CB # 7335, Suite 1100 Bondurant Hall  
321 S. Columbia Street  
Chapel Hill, NC 27599-7335  
(919) 966-8828  
(919) 843-3250

September 8, 2016

Douglas Strader, Director of Assessment  
Maryland State Department of Education  
200 W. Baltimore Street  
Baltimore, MD 21201

Dear Dr. Strader:

I am writing to confirm my willingness to serve as a member of the Project Governance Board for the *Innovations in Accessible Learning Maps, Assessments, and Reports in Science* grant proposal, submitted to the Enhanced Assessment Grants (EAG) Program of the U.S. Department of Education Office of Elementary and Secondary Education. I look forward to the opportunity to collaborate with the Maryland State Department of Education, partner states, and other organizations to develop inclusive learning maps in science with connections to ELA and math, innovative test items based on these learning maps, and a reporting system to support teaching and learning in science. As the associate director of professional development for the Dynamic Learning Maps Alternate Assessment Consortium, I have direct experience with this range of activities and understand their importance. Effective assessment of student with significant cognitive disabilities requires a carefully planned system that addresses the myriad needs of this complex population of students and supports their teachers in teaching them.

As an advisory member of the Project Governance Board, I agree to participate in scheduled meetings and calls and to provide consultation on the design, development, implementation, and evaluation of project goals and activities.

I look forward to the opportunity to collaborate with you on this project.

Sincerely,

Karen A. Erickson, Ph.D.  
Director, Center for Literacy & Disability Studies  
David E. & Dolores J. "Dee" Yoder Distinguished Professor  
Division of Speech and Hearing Sciences



Cara Cahalan Laitusis  
Senior Research Director  
Phone: (609) 734-1347  
Fax: (609) 734-1755  
E-mail: claitusisn@ets.org

September 13, 2016

Douglas Strader, Director of Assessment  
Maryland State Department of Education  
200 W. Baltimore Street  
Baltimore, MD 21201

Douglas Strader:

I am pleased to serve as a member of the Project Governance Board for the *Innovations in Accessible Learning Maps, Assessments, and Reports in Science* grant proposal, submitted to the Enhanced Assessment Grants (EAG) Program of the U.S. Department of Education Office of Elementary and Secondary Education. I am delighted for the opportunity to collaborate with the Maryland State Department of Education and partner states and organizations to develop inclusive learning maps in science with connections to ELA and math, innovative test items based on these learning maps, and a reporting system to support teaching and learning in science. The state of Maryland has been a leader in innovative assessment grants and accessibility so I have no doubt this grant would continue the track record of outstanding contributions. In addition, I believe work on accessible science assessments is extremely timely and needed as states struggle with how best to implement assessment that thread multiple constructs while balancing testing time and the need to provide instructionally relevant feedback to teachers and administrators.

As an advisory member of the Project Governance Board, I agree to participate in scheduled meetings and calls and to provide consultation on the design, development, implementation, and evaluation of project goals and activities.

I look forward to the opportunity to collaborate with you on this project.

Sincerely,

Cara Cahalan Laitusis  
Senior Research Director

September 8, 2016

Douglas Strader, Director of Assessment  
Maryland State Department of Education  
200 W. Baltimore Street  
Baltimore, MD 21201

Douglas Strader:

I am pleased to serve as a member of the Project Governance Board for the *Innovations in Accessible Learning Maps, Assessments, and Reports in Science* grant proposal, submitted to the Enhanced Assessment Grants (EAG) Program of the U.S. Department of Education Office of Elementary and Secondary Education. I am delighted for the opportunity to collaborate with the Maryland State Department of Education and partner states and organizations to develop inclusive learning maps in science with connections to ELA and math, innovative test items based on these learning maps, and a reporting system to support teaching and learning in science. As a lifelong educator who started my career as a high school and middle school science teacher I strongly believe this to be a particularly critical project. Science education is about the process of knowing and has been too often neglected in the education of children with disabilities. Use of learning maps holds great promise for helping teachers better educate students.

As an advisory member of the Project Governance Board, I agree to participate in scheduled meetings and calls and to provide consultation on the design, development, implementation, and evaluation of project goals and activities.

I look forward to the opportunity to collaborate with you on this project.

Sincerely,



Neal Kingston, Ph.D.  
Director, Achievement and Assessment Institute

September 8, 2016

Douglas Strader  
Director of Assessment  
Maryland State Department of Education  
200 W. Baltimore Street  
Baltimore, MD 21201

Dear Mr. Strader:

I am pleased to serve as a member of the Project Governance Board for the *Innovations in Accessible Learning Maps, Assessments, and Reports in Science* grant proposal, submitted to the Enhanced Assessment Grants (EAG) Program of the U.S. Department of Education Office of Elementary and Secondary Education. I am delighted for the opportunity to collaborate with the Maryland State Department of Education and partner states and organizations to develop inclusive learning maps in science with connections to ELA and math, innovative test items based on these learning maps, and a reporting system to support teaching and learning in science. I consider this work to be especially important as educators work to develop and disseminate tools and resources that can promote and support the vision for science teaching and learning found in the National Research Council's 2012 report entitled *A framework for K-12 science education: Practices, crosscutting concepts, and core ideas*.

As an advisory member of the Project Governance Board, I agree to participate in scheduled meetings and calls and to provide consultation on the design, development, implementation, and evaluation of project goals and activities.

I look forward to the opportunity to collaborate with you and your colleagues on this important and timely project.

Respectfully yours,



James W. Pellegrino  
Liberal Arts and Sciences Distinguished Professor  
Distinguished Professor of Education  
Co-director, *Learning Sciences Research Institute*

# The University of Kansas

Department of Educational Psychology

September 14, 2016

Douglas Strader, Director of Assessment  
Maryland State Department of Education  
200 W. Baltimore Street  
Baltimore, MD 21201

Douglas Strader:

I am pleased to serve as a member of the Project Governance Board for the *Innovations in Science Map, Assessment, and Report Technologies* grant proposal, submitted to the Enhanced Assessment Grants (EAG) Program of the U.S. Department of Education Office of Elementary and Secondary Education. I am delighted for the opportunity to collaborate with the Maryland State Department of Education and partner states and organizations to develop inclusive learning maps in science with connections to ELA and math, innovative test items based on these learning maps, and a reporting system to support teaching and learning in science. I believe the project is important and that its scope is attainable by the excellent team you have built.

As an advisory member of the Project Governance Board, I agree to participate in scheduled meetings and calls and to provide consultation on the design, development, implementation, and evaluation of project goals and activities.

I look forward to the opportunity to collaborate with you on this project.

Sincerely,



Jonathan Templin  
Associate Professor  
Department of Educational Psychology  
Achievement and Assessment Institute  
University of Kansas  
614 Joseph R. Pearson Hall  
1122 West Campus Road  
Lawrence, Kansas 66045

Phone: (785) 864-5714  
email: [jtemplin@ku.edu](mailto:jtemplin@ku.edu)

Department of Special Education

September 13, 2016

Douglas Strader, Director of Assessment  
Maryland State Department of Education  
200 W. Baltimore Street  
Baltimore, MD 21201

Douglas Strader:

I am pleased to submit this letter indicating my willingness to serve as a member of the Project Governance Board for the Innovations in Accessible Learning Maps, Assessments, and Reports in Science grant proposal, to be submitted to the Enhanced Assessment Grants (EAG) Program of the U.S. Department of Education Office of Elementary and Secondary Education. I highly value the opportunity to collaborate with the Maryland State Department of Education and partner states and organizations to develop inclusive learning maps in science with connections to ELA and math, innovative test items based on these learning maps, and a reporting system to support teaching and learning in science. I have been involved with research and practice to promote access to the general education curriculum for students with the most significant cognitive disabilities since the late 1990s, and believe the learning maps model provides the most promising innovation to achieve such access to emerge in the last decade. It is encouraging to see the learning maps efforts being extended to science content.

As an advisory member of the Project Governance Board, I agree to participate in scheduled meetings and calls and to provide consultation on the design, development, implementation, and evaluation of project goals and activities.

I look forward to the opportunity to collaborate with you on this project.

Sincerely,



Michael L. Wehmeyer, Ph.D.  
Ross and Mariana Beach Distinguished Professor of Special Education  
Director and Senior Scientist, Beach Center on Disability

**Phoebe C. Winter, Ph.D.**

2319 Traymore Road

Richmond, VA 23235

Telephone: 804.272.0996

phoebe.winter@outlook.com

September 13, 2016

Douglas Strader, Director of Assessment  
Maryland State Department of Education  
200 W. Baltimore Street  
Baltimore, MD 21201

Dear Dr. Strader:

I am pleased to serve as a member of the Project Governance Board for the *Innovations in Accessible Learning Maps, Assessments, and Reports in Science* grant proposal, submitted to the Enhanced Assessment Grants (EAG) Program of the U.S. Department of Education Office of Elementary and Secondary Education. I am delighted for the opportunity to collaborate with the Maryland State Department of Education and partner states and organizations to develop inclusive learning maps in science with connections to ELA and math, innovative test items based on these learning maps, and a reporting system to support teaching and learning in science. The use of learning maps as a foundation for assessments has the promise of providing more meaningful and actionable assessment results for improving student learning.

As an advisory member of the Project Governance Board, I agree to participate in scheduled meetings and calls and to provide consultation on the design, development, implementation, and evaluation of project goals and activities.

I look forward to the opportunity to collaborate with you on this project.

Sincerely,

Phoebe C. Winter  
Independent Consultant

## References for Project Narrative

- Abell, S.K. & Volkmann, M.J. (2006). *Seamless Assessment in Science: A guide for elementary and middle school teachers*. Portsmouth, NH: Heineman.
- Almond, P., Winter, P., Cameto, R., Russell, M., Sato, E., Clark-Midura, J., Torres, C., Haertel, G., Dolan, R., Beddow, P., Lazarus, S. (2010). Technology-enabled and universally designed assessment: considering access in measuring the achievement of students with disabilities-A foundation for research. *Journal of Technology, Learning, and Assessment*, 10(5).
- Alonzo, A.C., & Gotwals, A.W. (Eds.). (2012). *Learning progressions in science: Current challenges and future directions*. Rotterdam, Netherlands: Sense Publishers.
- American Educational Research Association (AERA). (2014). *Standards for educational & psychological testing*. Washington, D.C.: American Educational Research Association.
- Andersen, L., Bechard, S., & Merriweather, K. (2016, April). Equity in science education for SWSCD through alternate content standards. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Baltimore, MD.
- Berliner, D. (2011). Rational responses to high stakes testing: The case of curriculum narrowing and the harm that follows. *Cambridge Journal of Education*, 41(3), 287-302.  
doi:10.1080/0305764X.2011.607151
- Black, P., & Atkin, J. M. (2014). The Central Role of Assessment in Pedagogy. In N. G. Lederman & S. K. Abell (Eds.), *Handbook of Research on Science Education (775-790)*. New York, NY: Routledge.
- Britton, E. D., & Schneider, S. A. (2014) Large-scale assessment in science education. In N. G. Lederman and S. K. Abell (Eds.), *Handbook of Research on Science Education, Volume II* (pp. 791 – 808). New York, NY Routledge.
- Browder, D., & Spooner, F. (2014). *More language arts, math, and science for students with severe disabilities*. Baltimore, MD: Brookes Publishing.
- Carnevale, A., Smith, N., & Melton, M. (2011). *STEM*. Georgetown University Center of Education and the Workforce: Washington, DC. Retrieved from <https://cew.georgetown.edu/wp-content/uploads/2014/11/stem-complete.pdf>
- CAST. (2011). Universal design for learning guidelines version 2.0. Retrieved from National Center on Universal Design for Learning. Retrieved from <http://www.udlcenter.org/aboutudl/udlguidelines>
- Chung Wei, R., & Cor, K. (2015). *Assessing What Matters: Literacy Design Collaborative (LDC) Writing Tasks as Measures of Student Learning*. Retrieved from Literacy Design Collaborative Retrieved from [https://ldc.org/sites/default/files/research/SCALE%20Report\\_Assessing%20What%20Matters\\_7.24.15.pdf](https://ldc.org/sites/default/files/research/SCALE%20Report_Assessing%20What%20Matters_7.24.15.pdf)
- Conderman, G., Johnston-Rodriguez, S., Hartman, P., & Kemp, D. (2013). Preparing preservice secondary special educators. *Preventing School Failure* 57(4).
- Corcoran, T., Mosher, F. A., & Rogat, A. (2009, May). Learning progressions in science: An evidence based approach to reform (CPRE Research Report #RR-63). Philadelphia, PA: Consortium for Policy Research in Education.

- Daley, S. G., Hillaire, G., & Sutherland, L. M. (2014). Beyond performance data: Improving student help seeking by collecting and displaying influential data in an online middle-school science curriculum. *British Journal of Educational Technology*, 121–134.
- DeBoer, G. E. (2014). The history of science curriculum reform in the United States. In N. G. Lederman, & S. K. Abell (Eds.), *Handbook of Research on Science Education* (Vol. II, pp. 559-578). New York, NY: Routledge.
- DeBoer, G. E., Quellmalz, E. S., Davenport, J. L., Timms, M. J., Herrmann-Abell, C. F., Buckley, B. C., Jordan, K. A., Huang, C.-W. and Flanagan, J. C. (2014), Comparing three online testing modalities: Using static, active, and interactive online testing modalities to assess middle school students' understanding of fundamental ideas and use of inquiry skills related to ecosystems. *Journal of Research in Science Teaching*, 51: 523–554. doi: 10.1002/tea.21145
- DePascale, C., Dadey, N. & Lyons, S. (2016). Score comparability across computerized assessment delivery devices. Washington, DC: The Council of Chief State School Officers.
- Dolan, R. P., Burling, K. S., Harms, M., Beck, R., Hanna, E., & Jude, J. (2006). *Universal Design for Computer-Based Testing Guidelines*. Iowa City, IA: Pearson.
- Dolan, R. P., Burling, K., Harms, M., Strain-Seymour, E., Way, W., & Rose, D. H. (2013). *A Universal Design for Learning-based Framework for Designing Accessible Technology-Enhanced Assessments* (Research Report). Iowa City, IA: Pearson.
- Dynamic Learning Maps Consortium. (2016). 2014-15 Technical manual -- Year end model. Lawrence: University of Kansas.
- Fealing, K. H., Lai, Y., & Myers, S. L. (2015). *Pathways vs. Pipelines to broadening participation in the stem workforce*. *Journal of Women and Minorities in Science and Engineering*, 21(4).
- Gong, B. and Marion, S. (2006). *Dealing with flexibility in assessments for students with significant cognitive disabilities*. National Center for the Improvement of Educational Assessment, Inc: Dover, NH.
- Haertel, G., Haydel DeBarger, A., Cheng, B., Blackorby, J., Javitz, H., Ructtinger, L., . . . Hansen, E. G. (2010). *Using evidence-centered design and universal design for learning to design science assessment tasks for students with disabilities*. Menlo Park: SRI International.
- Hall, T. E., Meyer, A., & Rose, . H. (2012). *Universal Design for Learning in the Classroom: Practical Applications*. New York: The Guilford Press.
- Hemphill, F.C., and Vanneman, A. (2011). *Achievement gaps: how Hispanic and white students in public schools perform in mathematics and reading on the National Assessment of Educational Progress (NCES 2011-459)*. National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC.
- Karvonen, M., Clark, A. K., & Kingston, N. (2016). Designing alternate assessment score reports: Implications for instructional planning. In P. Kannan (Chair) *Thinking about your audience in designing and evaluating score reports*. Washington: National Council on Measurement in Education.

- Karvonen, M., Wakeman, S., Moody, S., & Flowers, C. (2013). The relationship of teachers' instructional decisions and beliefs about alternate assessments to student achievement. *Exceptionality, 21*, 238-252. doi: 10.1080/09362835.2012.747184
- Karvonen, M., Swinburne Romine, R., & Clark, A. K. (2016). Validity evidence to support alternate assessment score uses: Fidelity and response processes. Paper presented at the annual meeting of the National Council on Measurement in Education. Washington.
- Karvonen, M., Nash, B., & Clark, A. (in press). 2016 standard setting: Science (Technical Report No. 16-02). Lawrence, KS: University of Kansas, Center for Educational Testing and Evaluation.
- Keeley, P.K. (2014). *What are they thinking? Promoting elementary learning through formative assessment*. Arlington, VA: NSTA Press.
- Ketterlin-Geller, L. (2008). Testing students with special needs: A model for understanding the interaction between assessment and student characteristics in a universally designed environment. *Educational Measurement: Issues and Practice*, 3-16.
- Kleinert, H. L., Browder, D. M., & Towles-Reeves, E. A. (2009). Models of cognition for students with significant cognitive disabilities: Implications for assessment. *Review of educational research*, 301-326.
- Lee, S.-H., Wehmeyer, M. L., Palmer, S. B., & Little, T. D. (2008, August). Self-Determination and Access to the General Education Curriculum. *The Journal of Special Education*, 91-107.
- Leko, M.M., Brownell, M.T., Kiely, M.T. (2015). Envisioning the future of special education personnel preparation in standards-based era. *Exceptional Children*, SAGE Journals.
- Marsh, J. A., Pane, J. F., & Hamilton, L. S. (2006). Making sense of data-driven decision making in education. *Rand Education*, 1-15.
- McNeill, K., & Krajcik, J. (2006, April). *Supporting students' constructions of scientific explanation through generic versus context-specific written scaffolds*. Paper presented at the AERA annual meeting, San Francisco, CA.
- Meyer, A., Rose, D. H., & Gordon, D. (2014). *Universal design for learning: Theory and Practice*. Wakefield, MA: CAST Professional Publishing.
- Miles, B. M., Huberman, A. M., Saldana, J. (2014). *Qualitative Data Analysis: A Methods Sourcebook* (3rd Ed.), Arizona State University.
- Mislevy, R. J., Steinberg, L. S., & Almond, R. G. (2003). Focus article: On the structure of educational assessments. *Measurement*, 3-62.
- Mislevy, R. J., Haertel, G., Cheng, B. H., Rutstein, D., Vendlinski, T., Murray, E., Rose, D., Gravel, J., Colker, A. M. (2013). *Conditional inferences related to focal and additional knowledge, skills, and abilities*. Menlo Park: SRI International.
- Nash, B., Clark, A. K., & Karvonen, M. (2015). First contact: A census report on the characteristics of students eligible to take alternate assessments (Technical Report No. 16-01). Lawrence, KS: University of Kansas, Center for Educational Testing and Evaluation.
- National Center for Education Statistics. (2016). *The condition of education 2016*. Washington, DC: United States Department of Education.
- National Center on Universal Design for Learning. (2011). UDL guidelines-version 2.0: Research evidence. Retrieved from <http://www.udlcenter.org/research/researchevidence>

- National Research Council (NRC). (1996). National Science Education Standards. Washington, D.C.: National Academies Press.
- National Research Council (NRC) (2000). *Inquiry and the national science education standards*. Washington, DC: National Academy Press.
- National Research Council (NRC) (2001). Knowing what students know: The science and design of educational assessment. National Academy Press: Washington DC.
- National Research Council (NRC) (2010). *A framework for K–12 science education: Practices, crosscutting concepts, and core ideas*. Washington, DC: National Academy Press.
- National Research Council (NRC). (2012). *A framework for K-12 science education: Practices, crosscutting concepts, and core ideas*. Washington, D.C.: National Academies Press.
- National Science Foundation (NSF). (2014). Chapter 3. Science and engineering labor force. Retrieved from Science and Engineering Indicators 2014: <https://www.nsf.gov/statistics/seind14/index.cfm/chapter-3/c3h.htm>
- Nelson, L. L. (2014). Design and deliver: Planning and teaching using universal design for learning. Baltimore: Paul H. Brookes Publishing Co., Inc.
- Next Generation Science Standards (NGSS). (2013). Lead state partners. Retrieved from Next Generation Science Standards: <http://www.nextgenscience.org/lead-state-partners>
- Nitsch, C. (2013). *Dynamic Learning Maps: The Arc parent focus groups*. Unpublished manuscript. Washington, DC: The Arc.
- Office of Educational Technology. (2015). Ed tech developer's guide: A primer for software developers, startups, and entrepreneurs. Retrieved from Office of Educational Technology.
- Office of Educational Technology. (2016). National Education Technology Plan. Retrieved from Office of Educational Technology: <http://tech.ed.gov/netp/>
- Patton, Q. M. (1997). Utilization Focused Evaluation: The New Century Text (3rd Ed.), London: Sage Publications.
- Pellegrino, J. W. (2012). Assessment of science learning: Living in interesting times. *Journal of Research in Science Teaching*, 831-841.
- Quellmalz, E. S., DeBarger, A., Haertel, G., & Kreikemeier, P. (2005). Validities of science inquiry. assessments: Final report. Menlo Park, CA: SRI International.
- Quellmalz, E. S., Timms, M. J., Silberglitt, M. D., & Buckley, B. C. (2012). Science assessments for all: Integrating science simulations into balanced state science assessment systems. *Journal of Research in Science Teaching*, 49(3), 363–393.
- Rappolt-Schlichtmann, G., & Daley, S. G. (2013). Providing access to engagement in learning: The potential of universal design for learning in museum design. *Curator: The Museum Journal*.
- Rappolt-Schlichtmann, G., Daley, S. G., Lim, S., Lapinski, S., Robinson, K. H., & Johnson, M. (2013). Universal design for learning and elementary school science: Exploring the efficacy, use, and perceptions of a web-based science notebook. *Journal of Educational Psychology*, 1210-1225.
- Reardon, S. F. (2011). The widening academic achievement gap between rich and poor: New evidence and possible explanations. In G. J. Duncan & R. J. Murnane (Eds.), *Whither opportunity? Rising inequality, schools, and children's life chances* (pp. 91–115). New York: Russell Sage Foundation.

- Reich, C., Price, J., Rubin, E., & Steiner, M. A. (2010). Inclusion, Disabilities, and Informal Science Learning. A CAISE Inquiry Group Report. Washington: Center for Advancement of Informal Science Education.
- Roeber, E. (2002). *Setting standards on alternate assessments* (Synthesis Report 42). Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes.
- Rogers, C. M., Thurlow, M. L., & Lazarus, S. S. (2015). *Science alternate assessments based on alternate achievement standards (AA-AAS) during school year 2014-2015* (Synthesis Report 99). Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes.
- Rose, D., & Meyer, A. (2000). Universal design for individual differences. *Educational Leadership*, 58(3), 39-43.
- Russell, M., Almond, P., Higgins, J., Clarke-Midura, J., Johnstone, C., Bechard, S., & Fedorchak, G. (2010, June). *Technology enabled assessments: Examining the potential for universal access and better measurement in achievement*. Presentation at the Council of Chief State School Officers (CCSSO) National Conference on Student Assessment, Detroit MN.
- Rupp, A. A., Templin, J., & Henson, R. A. (2010). *Diagnostic measurement: Theory, methods, and applications*. New York: Guilford Press.
- Sandoval, W., & Reiser, B. (2004). Explanation-driven inquiry: Integrating conceptual and epistemic scaffolds for scientific inquiry. *Science Education*, 88, 345–372. doi:10.1002/sce.10130
- Smith, C. L., & Wiser, M. (2015). On the importance of epistemology-disciplinary core concept interactions in LPs. *Science Education*, 99(3), 417–423. <http://doi.org/10.1002/sce.21166>
- Stage, E. K., Asturias, H., Cheuk, T., Daro, P. A., & Hampton, S.B. (2013). Science education. Opportunities and challenges in next generation standards. *Science* 340(6130).
- Templin, J., & Bradshaw, L. (2013). Measuring the Reliability of Diagnostic Classification Model Examinee Estimates. *Journal of Classification*, 251-275.
- Thurlow, M. L., Lazarus, S. S., & Bechard, S. (Eds.). (2013). *Lessons learned in federally funded projects that can improve the instruction and assessment of low performing students with disabilities*. Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes.
- U.S. Department of Education (1997). Individuals with Disabilities Education Act Amendments of 1997, Public Law No. 105-7
- U.S. Department of Education. (2001). *No child left behind act of 2001*. Retrieved from <http://www2.ed.gov/policy/elsec/leg/esea02/index.html>
- U.S. Department of Education. (2004). Testing: Frequently asked questions. Retrieved from <http://www2.ed.gov/nclb/accountability/ayp/testing-faq.html>
- U.S. Department of Education. (2007, July 20). *Modified academic achievement standards: Non-regulatory guidance*. Washington, DC
- U.S. Department of Education. (2015). *Every student succeeds act (ESSA)*. Retrieved from <http://www2.ed.gov/documents/essa-act-of-1965.pdf>.
- U.S. Department of Education, Office of Elementary and Secondary Education. (2003, December). *Title I--Improving the academic achievement of the disadvantaged, final regulations*. Washington, DC: U.S. Author.
- Verbert, K., Duval, E., Klerx, J., Govaerts, S., & Santos, J. L. (2013). Learning analytics dashboard applications. *American Behavioral Scientist*, 1500-1509.

Windschitl, M. Thompson, J., & Braaten, M. (2011) Ambitious Pedagogy by Novice Teachers? Who Benefits From Tool-Supported Collaborative Inquiry into Practice and Why. *Teachers College Record*. 113(7), pp.1311-1360.

Yarbrough, D. B., Shulha, L. M., Hopson, R. K., and Caruthers, F. A. (2011). *The program evaluation standards: A guide for evaluators and evaluation users* (3rd ed.). Thousand Oaks, CA: Sage.

**DISCLOSURE OF LOBBYING ACTIVITIES**

Approved by OMB  
0348-0046

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352  
(See reverse for public burden disclosure.)

<b>1. Type of Federal Action:</b> <input type="checkbox"/> a. contract <input checked="" type="checkbox"/> b. grant c. cooperative agreement d. loan e. loan guarantee f. loan insurance	<b>2. Status of Federal Action:</b> <input checked="" type="checkbox"/> a. bid/offer/application b. initial award c. post-award	<b>3. Report Type:</b> <input type="checkbox"/> a. initial filing <input type="checkbox"/> b. material change <b>For Material Change Only:</b> year _____ quarter _____ date of last report _____
<b>4. Name and Address of Reporting Entity:</b> <input type="checkbox"/> Prime <input checked="" type="checkbox"/> Subawardee Tier _____, if known:  <b>Congressional District, if known:</b>	<b>5. If Reporting Entity in No. 4 is a Subawardee, Enter Name and Address of Prime:</b> N/A  <b>Congressional District, if known:</b>	
<b>6. Federal Department/Agency:</b> N/A	<b>7. Federal Program Name/Description:</b> N/A  CFDA Number, if applicable: _____	
<b>8. Federal Action Number, if known:</b> N/A	<b>9. Award Amount, if known:</b> \$ N/A	
<b>10. a. Name and Address of Lobbying Registrant</b> (if individual, last name, first name, MI): N/A	<b>b. Individuals Performing Services</b> (including address if different from No. 10a) (last name, first name, MI): N/A	
<b>11.</b> Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.	Signature: <u>Alicia M. Reed/mt</u> Print Name: <u>Alicia M. Reed</u> Title: <u>Interim, Director, Research Administration</u> Telephone No.: <u>785-864-3441</u> Date: <u>09/22/2016</u>	
<b>Federal Use Only:</b>		Authorized for Local Reproduction Standard Form LLL (Rev. 7-97)

## DISCLOSURE OF LOBBYING ACTIVITIES

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352

Approved by OMB

0348-0046

(See reverse for public burden disclosure.)

<b>1. Type of Federal Action:</b> <input type="checkbox"/> a. contract <input checked="" type="checkbox"/> b. grant c. cooperative agreement d. loan e. loan guarantee f. loan insurance	<b>2. Status of Federal Action:</b> <input type="checkbox"/> a. bid/offer/application <input checked="" type="checkbox"/> b. initial award c. post-award	<b>3. Report Type:</b> <input type="checkbox"/> a. initial filing <input type="checkbox"/> b. material change <b>For Material Change Only:</b> year _____ quarter _____ date of last report _____
<b>4. Name and Address of Reporting Entity:</b> <input type="checkbox"/> Prime <input checked="" type="checkbox"/> Subawardee Tier _____, if known:  Congressional District, if known: 4c	<b>5. If Reporting Entity in No. 4 is a Subawardee, Enter Name and Address of Prime:</b> University of Kansas Center for Research, Inc. 2385 Irving Hill Road Lawrence, KS 66045-7568  Congressional District, if known: KS-002	
<b>6. Federal Department/Agency:</b> U.S. Dept of Ed, Office of Elem & Secondary Ed	<b>7. Federal Program Name/Description:</b> Grants for Enhanced Assessment Instruments  CFDA Number, if applicable: 84.368	
<b>8. Federal Action Number, if known:</b> NA	<b>9. Award Amount, if known:</b> \$ NA	
<b>10. a. Name and Address of Lobbying Registrant</b> (if individual, last name, first name, MI): NA	<b>b. Individuals Performing Services</b> (including address if different from No. 10a) (last name, first name, MI): NA	
<b>11.</b> Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.	Signature: <u>Carole Lacy</u> Print Name: <u>Carole Lacy</u> Title: <u>Chief Financial Officer</u> Telephone No.: <u>781-245-2212, ext 229</u> Date: <u>9/16/16</u>	
<b>Federal Use Only:</b>		Authorized for Local Reproduction Standard Form LLL (Rev. 7-97)

## INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.
2. Identify the status of the covered Federal action.
3. Identify the appropriate classification of this report. If this is a followup report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.
4. Enter the full name, address, city, State and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.
5. If the organization filing the report in item 4 checks "Subawardee," then enter the full name, address, city, State and zip code of the prime Federal recipient. Include Congressional District, if known.
6. Enter the name of the Federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.
7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.
8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitation for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Include prefixes, e.g., "RFP-DE-90-001."
9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.
10. (a) Enter the full name, address, city, State and zip code of the lobbying registrant under the Lobbying Disclosure Act of 1995 engaged by the reporting entity identified in item 4 to influence the covered Federal action.  
  
(b) Enter the full names of the individual(s) performing services, and include full address if different from 10 (a). Enter Last Name, First Name, and Middle Initial (MI).
11. The certifying official shall sign and date the form, print his/her name, title, and telephone number.

According to the Paperwork Reduction Act, as amended, no persons are required to respond to a collection of information unless it displays a valid OMB Control Number. The valid OMB control number for this information collection is OMB No. 0348-0046. Public reporting burden for this collection of information is estimated to average 10 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, DC 20503.

**DISCLOSURE OF LOBBYING ACTIVITIES**

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352

Approved by OMB

0348-0046

(See reverse for public burden disclosure.)

<b>1. Type of Federal Action:</b> <input type="checkbox"/> a. contract <input checked="" type="checkbox"/> b. grant c. cooperative agreement d. loan e. loan guarantee f. loan insurance	<b>2. Status of Federal Action:</b> <input type="checkbox"/> a. bid/offer/application <input type="checkbox"/> b. initial award <input type="checkbox"/> c. post-award	<b>3. Report Type:</b> <input type="checkbox"/> a. initial filing <input type="checkbox"/> b. material change <b>For Material Change Only:</b> year _____ quarter _____ date of last report _____
<b>4. Name and Address of Reporting Entity:</b> <input type="checkbox"/> Prime <input checked="" type="checkbox"/> Subawardee Tier _____, if known:  Congressional District, if known: 4c	<b>5. If Reporting Entity in No. 4 is a Subawardee, Enter Name and Address of Prime:</b> University of Kansas Center for Research, Inc. 2385 Irving Hill Road Lawrence, KS 66045-7568  Congressional District, if known: KS-002	
<b>6. Federal Department/Agency:</b> U.S. Dept of Ed, Office of Elem & Secondary Ed	<b>7. Federal Program Name/Description:</b> Grants for Enhanced Assessment Instruments  CFDA Number, if applicable: 84.368	
<b>8. Federal Action Number, if known:</b> NA	<b>9. Award Amount, if known:</b> \$ NA	
<b>10. a. Name and Address of Lobbying Registrant</b> (if individual, last name, first name, MI): NA	<b>b. Individuals Performing Services</b> (including address if different from No. 10a) (last name, first name, MI): NA	
<b>11.</b> Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.	Signature:  Print Name: Bruce T. Yelton Title: Owner Telephone No.: 704-904-6951      Date: 9/16/16	
<b>Federal Use Only:</b>	Authorized for Local Reproduction Standard Form LLL (Rev. 7-97)	

# Innovations in Science Map, Assessment, and Report Technologies (I-SMART)

CFDA 84.368A

## Part 5 Contents (Budget Narrative)

1. Narrative from Maryland State Department of Education
2. Narrative from Sub-Awardees
  - a. University of Kansas Center for Research on behalf of Center for Educational Testing & Evaluation
  - b. CAST
  - c. BYC Consulting

All salaries are set consistent with MSDE policies. A 4% increase is calculated in Years 2-4.			
<b>1.PERSONNEL</b>	<b>FTE</b>	<b>BASE SALARY</b>	<b>TOTAL*</b>
<b>Key Personnel:</b>			
<b>Marsie Torchon, BS</b> , Program Specialist for Alternate Assessments at MSDE, Project Director for I-SMART. Ms. Torchon will chair the governance board and oversee the project on behalf of the Maryland State Department of Education (MSDE).	Yr1:20%	\$	\$0
	Yr2:20%	\$	\$0
	Yr3:20%	\$	\$0
	Yr4:20%	\$	\$0
			*MSDE salaries are in-kind.
<b>Other Personnel:</b>			
<b>Ann Herrmann, MEd</b> , Section Chief for MSDE. Ms. Herrmann will serve on the Project Governance Board and support the Project Director in overseeing I-SMART.	Yr1:10%		\$0
	Yr2:10%		\$0
	Yr3:10%		\$0
	Yr4:10%		\$0
			*MSDE salaries are in-kind.

<b>2. FRINGE BENEFITS</b>	Yr1 Yr2 Yr3 Yr4		\$0  *MSDE salaries are in-kind.
---------------------------	--------------------------	--	--

<b>3. TRAVEL -</b> Travel costs include one local Project Governance Board meetings in Yrs 1-4 and three presentations at national conferences in Yrs3-4. The remaining travel costs for project activities and events are incorporated in the KU subcontract, partner state travel related to project management and implementation. All travel will be reimbursed at the GSA CONUS/OCONUS rates in effect at time of trip and based on destination.	<b>Basis for Cost Estimate</b>	<b># of people</b>	<b>\$ per person per trip</b>	<b>Total</b>
<b>Purpose of Travel</b>				
<b>Project Governance Board Meetings:</b> Two staff members will attend a 1-day Project Governance meeting in Baltimore, MD area annually.  The Governance Board will guide project leadership on decision-making, processes and products of the project, ensuring continuous	Mileage to/from location around Baltimore (x 1 trip each x 50 miles max)	2 people	Mileage: \$54	\$54 each year for 4 years = \$432

<p>improvements in design and delivery of high quality products. The governance board meets face to face annually and has regularly scheduled conference calls throughout each year.</p>	<p>Mileage reimbursed at \$.54 per mile</p>			
<p><b>Conference Travel:</b> One person will travel to three professional conferences or meetings in Yr3 and Yr4. It is anticipated that these conferences will last four days, with three nights lodging. Staff will submit proposals to present about project progress and findings at three national conferences (e.g., AERA, NCME, CEC, NCSA) each year to disseminate findings. Year 4 has a 4% increase.</p> <p>Staff will disseminate collection of products developed in Goals 1-3 that describe the project’s lessons learned, research outcomes, and best practices that can serve as models and resources for other states.</p>	<p>Average airfare of \$600 per person</p> <p>Lodging of up to \$200 per night person</p> <p>Per diem of \$69 per day per person</p> <p>Mileage to/from airport reimbursed at \$.54 per mile</p> <p>Registration fees of \$300 per person</p> <p>Other Travel Costs including ground transportation and Airline fees - \$100 per person</p>	<p>Yr 3&amp;4: 1 person</p>	<p>Airfare: \$600</p> <p>Lodging (3 nights): \$600</p> <p>Per diem (4 days): \$240</p> <p>Mileage: \$110</p> <p>Registration fee: \$300</p> <p>Other Travel: \$100</p>	<p>Yr3: \$5,806</p> <p>Yr4: \$6,038</p>

<p><b>4. EQUIPMENT</b></p>	<p>\$0</p>
----------------------------	------------

<p><b>5. SUPPLIES</b></p>	<p>\$0</p>
---------------------------	------------

<p><b>6. CONTRACTUAL –</b></p>	
<p><b>University of Kansas Center for Research (KUCR)</b> The project will be administered by the <b>Center for Educational Testing and Evaluation (CETE)</b>, which resides within the Achievement and Assessment Institute (AAI), at KU. CETE will lead the development and evaluation of the learning map model (Goal 1), develop and evaluate innovating and engaging</p>	<p>Yr1:\$772,055 Yr2:\$1,330,823 Yr3:\$846,801 Yr4:\$871,472</p>

assessments based on UDL principles (Goal 2), develop and evaluate a reporting dashboard that provides timely feedback regarding student performance on assessments (Goal 3), and develop and implement a plan to disseminate project materials (Goal 4). CETE will also oversee tasks related to project management, such as administering the budget for KU and contracts with grant partners, supervising CETE staff, monitoring the project timeline and facilitating project meetings.	
---	--

<b>7. CONSTRUCTION</b> (not applicable)	\$ 0
---	------

<b>8. OTHER</b>	\$ 0
<b>Printing and Copying:</b> \$100 Yr1; \$104 Yr2; \$108 Yr3; \$112 Yr4 in accordance with the scope of the project – Funds are needed for routine printing and copying, including the purchase of paper and cost of impressions, for oversight of the project, including reporting to USED.	\$425
<b>Communication Expenses:</b> \$360 Yr1; \$374 Yr2; \$389 Yr3; \$405 Yr4 Including conference calls, postage, FedEx, \$359 average each year (2% increase per year)	\$1,529

<b>9. DIRECT COSTS</b>	Year One	Year Two	Year Three	Year Four	TOTAL
	\$772,569	\$1,331,356	\$853,159	\$878,082	\$3,835,165

<b>10. INDIRECT COSTS</b>				
Indirect Costs are calculated at 13.50% of modified total direct costs				
Year One	Year Two	Year Three	Year Four	TOTAL
\$6,819	\$72	\$858	\$892	\$8,642

<b>11. TRAINING STIPENDS (Not Applicable)</b>	\$ 0
---	------

<b>12. TOTAL COSTS</b>	Year One	Year Two	Year Three	Year Four	TOTAL
	\$779,388	\$1,331,428	\$854,017	\$878,974	\$3,843,807

All salaries are set consistent with university policies. A 2% increase is calculated in Years 2-4.			
<b>1.PERSONNEL</b>	<b>FTE</b>	<b>BASE SALARY</b>	<b>TOTAL</b>
<b>Key Personnel:</b>			
<b>Meagan Karvonen, Ph.D.</b> , Associate Director of the Center for Educational Testing and Evaluation at KU, PI for I-SMART. Dr. Karvonen will oversee the governance, research, design, implementation, and dissemination activities. She will serve as the primary contact to MDSE for project implementation and oversight; ensure that all project activities are proceeding as planned; and oversee expenditures for the KU portion of the budget.	Yr1:15% Yr2:15% Yr3:15% Yr4:15%	\$137,865 \$140,622 \$143,435 \$146,303	\$20,680 \$21,093 \$21,515 \$21,946
<b>Russell Swinburne-Romine, Ph.D.</b> , co-PI for I-SMART. Dr. Swinburne Romine will be will be on the leadership and research teams and will co-lead the assessment design team. He will also supervise the Research Project Manager.	Yr1:20% Yr2:20% Yr3:20% Yr4:20%	\$91,000 \$92,820 \$94,676 \$96,570	\$18,200 \$18,564 \$18,935 \$19,314
<b>Research Project Manager, TBH</b> , will be responsible for coordinating activities between teams and external partners and for routine monitoring of project management and deliverables. The RPM will support study recruitment, collaboration among teams, technical documentation, manage timelines and deliverables and contribute to the research effort in all four years. The RPM will assist the PI and co-PIs with communications, meeting and event planning, travel arrangements, and conference calls.	Yr1:100% Yr2:100% Yr3:100% Yr4:100%	\$75,000 \$76,500 \$78,030 \$79,591	\$75,000 \$76,500 \$78,030 \$79,591
<b>Sue Bechard, Ph.D.</b> , serves on the leadership and research teams and is a senior advisor who will contribute significantly to all four project goals, with greater responsibility in Goals 1-2.	Yr1:10% Yr2:10% Yr3:5% Yr4:5%	\$176,800 \$180,336 \$183,943 \$187,622	\$17,680 \$18,034 \$9,197 \$9,381
<b>Lori Andersen, Ph.D.</b> , serves on the research team, and will have principal responsibility for the development of the science learning map model (Goal 1). She will also consult on assessment design (Goal 2).	Yr1:20% Yr2:5% Yr3:5% Yr4:5%	\$87,000 \$88,740 \$90,515 \$92,325	\$17,400 \$4,437 \$4,526 \$4,616
<b>Brooke Nash, Ph.D.</b> , serves on the research team and leads the psychometric team with principal responsibility for psychometrics (Goal 2), data management and analysis (Goals 1-3).	Yr1:5% Yr2:15% Yr3:15% Yr4:15%	\$87,000 \$88,740 \$90,515 \$92,325	\$4,350 \$13,311 \$13,577 \$13,849
<b>Lindsay Ruhter, M.A.</b> , leads the development of innovative test items (Goal 2). She will also support learning map development (Goal 1).	Yr1:15% Yr2:20% Yr3:5% Yr4:0%	\$58,000 \$59,160 \$60,343 \$0	\$8,700 \$11,832 \$3,017 \$0
<b>Amy Clark, Ph.D.</b> , serves on the psychometric team and supports data management and analysis (Goals 1-3).	Yr1:0% Yr2:5% Yr3:10% Yr4:5%	\$0 \$85,476 \$87,186 \$88,929	\$0 \$4,274 \$8,719 \$4,446
<b>Michelle Shipman, B.A.</b> , will serve on the assessment design team and supervise the development of Essential	Yr1:10% Yr2:10%	\$71,000 \$72,420	\$7,100 \$7,242

Element Concept Maps and preparations for item writing and external review (Goal 2).	Yr3:0% Yr4:0%	\$0 \$0	\$0 \$0
<b>Susan Martin, B.S.</b> , will have oversight of the technology team that delivers the technology enhancements for Goal 2 and the online dashboard for Goal 3 after it is designed by CAST.	Yr1:0% Yr2:3% Yr3:3% Yr4:3%	\$0 \$163,200 \$166,464 \$169,793	\$0 \$4,896 \$4,994 \$5,094
<b>Other Personnel:</b>			
Other KU staff, including a Psychometrician Assistant, Curriculum & Assessment Assistant, Assistant Researcher, Administrative Assistant, Editing and Communications staff, Technology staff, and graduate students will support implementation of the project scope (Goals 1-4).	Yr1 Yr2 Yr3 Yr4		\$67,643 \$327,590 \$120,747 \$153,442

<b>2. FRINGE BENEFITS</b> Benefits for the University of Kansas are calculated at 35% for faculty and staff: Social Security 6.20%, Medicare 1.45%, Retirement (including death and disability) 10.5%, Worker’s Compensation 0.441%, Unemployment Insurance 0.11%, Health Insurance 14.81%, Sick/Annual Leave 1.03%. Benefits for students are calculated at 7%: Worker’s Compensation 0.441%, Unemployment Insurance 0.11%, Health Insurance 5.92%, Sick/Annual Leave 0.329%.  Benefits for Students are calculated at 15% > 75% FTE and 7% < 75% FTE.	Yr1 Yr2 Yr3 Yr4		\$77,622 \$171,896 \$92,734 \$102,681
--	--------------------------	--	--

<b>3. TRAVEL -</b> Per university policy, all travel will be reimbursed at the GSA CONUS/OCONUS rates in effect at time of trip and based on destination.	<b>Basis for Cost Estimate</b>	<b># of people</b>	<b>\$ per person per trip</b>	<b>Total</b>
<b>Purpose of Travel</b> <b>Project Governance Board Meetings:</b> Eight staff members will attend a 1-day Project Governance meeting in Baltimore, MD annually. Staff will facilitate the meeting, present, and handle logistics for participants and the meeting site.  The Project Governance Board will guide project leadership on decision-making, processes and products of the project, ensuring continuous improvements in design and delivery of high quality products. The governance board meets face to face annually	Airfare of \$400/person  Lodging of up to \$175/per night  Per diem of \$69 per day  Other travel costs include	8 people	Airfare: \$400  Lodging 2 nights: \$350  Per diem 1 day: \$69  Other: \$50	Yrs 1-4: \$6,027

<p>and has regularly scheduled conference calls throughout each year.</p>	<p>ground transport and Airline fees</p> <p>Mileage from Lawrence, KS to Airport Mileage reimbursed at \$.54 per mile</p>		<p>Costs per person per trip: \$59</p>	
<p><b>Learning Map Review:</b> Seven Staff members will attend a 2 day meeting in Baltimore, MD, Yr 1.</p> <p>The learning map model review is a 2-day event in which participants will evaluate the model (Goal 1). Staff will facilitate the meeting as well as present, train, monitor, and handle logistics for participants and the meeting site.</p>	<p>Airfare of \$400/person</p> <p>Lodging of up to \$175/per night</p> <p>Per diem of \$69 per day</p> <p>Other travel costs include ground transport and Airline fees</p> <p>Mileage from Lawrence, KS to Airport Mileage reimbursed at \$.54 per mile</p>	<p>7 People</p>	<p>Airfare: \$400</p> <p>Lodging 2 nights: \$350</p> <p>Per diem 1 day: \$69</p> <p>Other: \$50</p> <p>Costs per person per trip: \$59</p>	<p>Yr 1 Only: \$6,499</p>
<p><b>Item Writing Workshop:</b> Seven Staff members will attend a 3 day meeting in Baltimore, MD, Yr 2.</p> <p>The item writing workshop is a 3-day event in which participants will develop innovative, instructionally relevant assessments using UDL principles as described in Goal 2. Staff will facilitate the meeting as well as present, train, monitor, and handle logistics for participants and the meeting site.</p>	<p>Airfare of \$400/person</p> <p>Lodging of up to \$175/per night</p> <p>Per diem of \$69 per day</p> <p>Other travel costs include ground</p>	<p>7 People</p>	<p>Airfare: \$400</p> <p>Lodging 3 nights: \$525</p> <p>Per diem 2 day: \$138</p> <p>Other: \$50</p>	<p>Yr 2 Only: \$8,207</p>

	<p>transport and Airline fees</p> <p>Mileage from Lawrence, KS to Airport Mileage reimbursed at \$.54 per mile</p>		<p>Costs per person per trip: \$59</p>	
<p><b>Testlet External Review:</b> Seven Staff members will attend a 2 day meeting in Baltimore, MD, Yr 2.</p> <p>The 1-day external review meeting will be held so participants can review and evaluate the innovative assessments developed at the Item Writing Workshop in Year 2 for science content, accessibility, bias and sensitivity, and instructional relevance. Staff will facilitate the meeting as well as present, train, monitor, and handle logistics for participants and the meeting site.</p>	<p>Airfare of \$400/person</p> <p>Lodging of up to \$175/per night</p> <p>Per diem of \$69 per day</p> <p>Other travel costs include ground transport and Airline fees</p> <p>Mileage from Lawrence, KS to Airport Mileage reimbursed at \$.54 per mile</p>	7 People	<p>Airfare: \$400</p> <p>Lodging 2 nights: \$350</p> <p>Per diem 1 day: \$69</p> <p>Other: \$50</p> <p>Costs per person per trip: \$59</p>	Yr 1 Only: \$6,499
<p><b>Data Collection:</b> 1 person/2 trips YR 2-3 One staff member will travel two times per year (four times total) to a participating state site for data collection related to Goals 2 (pilot administration) and 3 (dashboard usability and interpretability). Anticipated sites are districts in Maryland, Oklahoma, New Jersey, Missouri, and New York.</p>	<p>Mileage from Lawrence, KS to KCMO Mileage reimbursed at \$.54 per mile</p> <p>Airfare of \$400 for 1 staff person</p> <p>Lodging of up to \$175 per night</p> <p>Per diem of \$69 per day 1 person/trip</p>	1 person	<p>Costs per person per trip: \$59</p> <p>Airfare: \$400</p> <p>Lodging 2 nights: \$350</p> <p>Per diem 3 day: \$207</p>	Yrs 2 - 3: \$2,433

	Car Rental: \$100/day		Car Rental: \$200	
<p><b>Conference Travel:</b> Three persons will travel to one professional conference or meeting in Yr3 and Yr4 (six trips total). It is anticipated that these conferences will last four days, with three nights lodging. Yr4 has a 4% increase. Staff will submit proposals to present about project progress and findings at three national conferences (e.g., AERA, NCME, CEC, NCSA, ASTE, NARST) each year to disseminate findings. Staff will disseminate collection of products developed in Goals 1-3 that describe the project’s lessons learned, research outcomes, and best practices that can serve as models and resources for other states.</p>	<p>Average airfare of \$600 per person</p> <p>Lodging of up to \$200 per night person</p> <p>Per diem of \$69 per day per person</p> <p>Mileage to/from airport reimbursed at \$.54 per mile</p> <p>Registration fees of \$250 per person</p> <p>Other Travel Costs including ground transportation and Airline fees - \$100 per person</p>	Yr 3&4: 3 people	<p>Airfare: \$600</p> <p>Lodging 3 nights: \$600</p> <p>Per diem 4 days: \$276</p> <p>Mileage: \$59</p> <p>Registration fee: \$300</p> <p>Other Travel: \$100</p>	<p>Yr3: \$5,628</p> <p>Yr4: \$5,853</p>

<b>4. EQUIPMENT</b>	\$0
---------------------	-----

<b>5. SUPPLIES</b>	
<p><b>Laptop for Research Project Manager</b> The RPM will be responsible for coordinating activities between teams and external partners and for routine monitoring of project management and deliverables. The RPM is a new staff member 100% dedicated to I-SMART. The RPM will use his or her laptop to assist the PI and co-PIs with communications, meeting and event planning, travel arrangements, and conference calls.</p>	\$2,000
<b>Materials for videos</b>	\$250

Funds are needed to purchase props and materials for use in science experiment and simulation videos that will be incorporated in testlets for Goal 2 (Yr2).	
<b>Learning map materials</b> Funds are needed to purchase books and other resources that provide the research basis for learning map model development (Goal 1, Yr1).	\$500

<b>6. CONTRACTUAL –</b>	
<b>CAST</b> CAST was selected for this project due to the organization’s research team, which has considerable expertise in cognition and learning; affective, emotional and social development; formative assessment, informal science learning design, Universal Design for Learning (UDL), advanced technical development and interface design, instructional design in technology-based interventions, and implementation of formative evaluation and experimental/quasi-experimental evaluations of instructional interventions. For the I-SMART project, CAST staff will co-lead the Assessment Design Team and participate on the other project teams for all four years of the project. They will also lead the prototyping for Goal 3 (dashboard). CAST staff include several research scientists who together will allocate .95 FTE to the project. CAST will also contract with Dr. Robert Dolan as a consultant with special expertise in applying UDL principles to pedagogy and technology integration.	Yr1:\$226,753 Yr2:\$268,048 Yr3:\$259,658 Yr4:\$247,541
<b>BYC Consulting</b> BYC Consulting is a highly specialized research and evaluation firm that provides services to educational and human service organizations, including evaluation of federally-funded projects. BYC Consulting was selected for this project due to their prior experience with evaluating an Enhanced Assessment Grant project and their emphasis on utilization-focused evaluation to promote usefulness and comprehension of data for stakeholders. BYC Consulting will contract all four years for a total of 70 days of effort, with variable effort per year based on the timeline for evaluation data collection.	Yr1:\$19,060 Yr2:\$13,940 Yr3:\$25,700 Yr4:\$15,900

<b>7. CONSTRUCTION</b> (not applicable)	\$ 0
---	------

<b>8. OTHER</b>	
<b>Printing and Copying:</b> \$1,100 Yrs 1-2; \$600 Yrs 3-4 in accordance with the scope of the project – Funds are needed for routine printing and copying, including the purchase of paper and cost of impressions, to meet project objectives. A higher amount is anticipated in Year 1 for project start-up and learning map development and review and in Year 2 for materials needed to conduct the item writing workshop and external testlet reviews.	\$3,400
<b>Communication Expenses:</b> Including conference calls, postage, FedEx, \$359 average each year (2% increase per year)	\$1,434
<b>Website:</b> IP address for project website. Yr 1 @ \$100 per month (2% increase each year)	\$4,946
<b>Project Governance Board:</b> Honoraria for advisory members – 7 member x 2 days x \$1,000 Yr1; 7 members x 1.5 days . \$1,000 Yrs 2-4	\$45,500

Travel expenses for all members except MD representatives - 15 people, 1 trip Yrs 1-4, \$600 transportation (includes ground and other travel expenses), \$175 lodging for 1 day, \$69 per diem for 1 day - \$844 per person per trip (4% increase in costs per year)	\$53,760
<b>Learning Map External Review:</b> Honoraria for reviewers – 9 people x 2 days x \$350/day Yr 1– will attend a 2-day meeting to review learning maps and evaluate the learning map model developed in Goal 1.	\$6,300
Travel expenses for 9 people, 1 trip Yr 1, \$600 transportation (includes ground and other travel expenses), \$350 lodging for 2 days, \$104 per diem for 1.5 days, - \$1,054 per person per trip	\$9,482
<b>Item Writing:</b> Stipend for item writers – 12 people x 3.5 days x \$350/day Yr 2 will develop innovative, instructionally relevant assessments using UDL principles as described in Goal 2 using the learning map model developed in Goal 1.	\$14,700
Travel expenses 12 people, 1 trip Yr 2, \$600 transportation (includes ground and other travel expenses), \$525 lodging for 3 days, \$138 per diem for 2 days, - \$1,263 per person per trip	\$15,156
<b>External Testlet Review:</b> Honoraria for Testlet Reviewers –15 people x 1 day x \$350/day Yr 2– will review and evaluate the innovative assessments developed at the Item Writing Workshop in Year 2 for science content, accessibility, bias and sensitivity, instructional relevance and editorial style.	\$5,250
Travel expenses 15 people, 1 trip Yr 2, \$600 transportation (includes ground and other travel expenses), \$350 lodging for 2 day, \$69 per diem for 1 day, - \$1,019 per person per trip	\$15,285
<b>Research Participants:</b> Honoraria will be provided to Goal 3 research participants who participate in the needs assessment (Obj 3.1, Yr1), prototype review (Obj 3.2, Yr2), and evaluation of dashboard usability and interpretation (Obj 3.4, Yr4). 15 participants Yr1 & Yr2, 16 participants Y4. \$50 per honorarium.	Yr1:\$750 Yr2:\$750 Yr4:\$800
<b>Meeting Costs:</b> Includes food, audio visual, room rental and WIFI costs for each meeting. \$3,500/day for all events except project governance board (\$6,000/day, 4% annual increase), which has additional AV costs due to extra microphones and conference line costs. Governance Board Meeting All Years Learning Map External Review Year 1 Item Writing Workshop Year 2 Testlet External Review Year 2	\$25,479 \$7,000 \$10,500 \$3,500
<b>Rent:</b> Cost of office space for staff who are based off campus. Calculated as \$3,375 per FTE per year.	Yr1:\$13,500 Yr2:\$23,625 Yr3:\$10,125 Yr4:\$10,125
<b>Tuition Expense for Graduate Research Assistants:</b> Per University of Kansas policy, Graduate Assistant tuition is requested for the Graduate Research Assistants each year. The rate is calculated in accordance with the University of Kansas tuition and fee schedule.	Yr1:\$10,528 Yr2:\$10,989 Yr3:\$11,467 Yr4:\$11,957

<b>9. DIRECT COSTS</b>	Year One	Year Two	Year Three	Year Four	TOTAL
	\$659,332	\$1,118,663	\$730,100	\$747,281	\$3,255,375

<b>10. INDIRECT COSTS</b>					
Indirect Costs are calculated at 26% of modified total direct costs					
Year One	Year Two	Year Three	Year Four	TOTAL	
	\$112,723	\$212,160	\$116,701	\$124,191	\$565,775

<b>11. TRAINING STIPENDS (Not Applicable)</b>					\$	0
---	--	--	--	--	----	---

<b>12. TOTAL COSTS</b>	Year One	Year Two	Year Three	Year Four	TOTAL
	\$772,055	\$1,330,823	\$846,801	\$871,472	\$3,821,151

**CAST BUDGET NARRATIVE**

*Innovations in Science Map, Assessment, and Report Technologies (I-SMART)  
Maryland State Department of Education*

**U.S. DOE – Office of Elementary and Secondary Education—Enhanced Assessment  
Instruments Grant Program CFDA: 84.368A**

**1. Personnel:** Each staff member’s salary is based on a 12-month time period and reflects a 3% increase/year beginning in Year 2.

**Jose Blackorby, Ph.D., Co-Principal Investigator, CAST Senior Director of Research and Development (.20 FTE Years 1-4).** As Co-PI Dr. Blackorby will be part of the leadership team directing the overall project to ensure deliverables are met on time and on budget. In addition, Blackorby will be co-leading the research team and the assessment design team in collaboration with Co-PI Swinburne Romine.

**Tracey Hall, Ph.D., CAST Senior Research Scientist (.20 FTE Years 1-4).** In collaboration with the PI and Co-PIs, Dr. Hall will bring her expertise in UDL and assessment design to Goal 2 activities around the reconceptualization of testlet design to incorporate UDL principles. In addition, she will contribute her expertise in iterative technology development to Goal 3 activities including developing prototypes and collecting feedback on the dashboard.

**David H. Rose, Ed.D., Founder and Chief Education Officer (.05 FTE Years 1-4).** In collaboration with the PI and Co-PIs, Dr. Rose will be a contributor to the assessment design team and will apply his expertise in UDL and assessments to the overall project goals and deliverables to ensure UDL principles are deeply embedded into the new assessments.

**Miriam Evans, Ph.D., Associate Research Scientist (.20 FTE Years 1-4).** Will collaborate with the PI and Co-PIs to support the tryouts of the testlets with users as part of Goal 2 and will support the tryouts of the dashboard with teachers as part of Goal 3.

**Cassandra Sell, B.S., Senior Interaction/UX Designer (.20 FTE Year 2; .10 Year 3; .05 Year 4),** will develop and revise mock-ups as part of the iterative design of the testlets and dashboard and will create the final design files for the University of Kansas.

**Administration and Data Manager, TBN (.10 FTE, Years 1-4),** will collaborate with the project team to support data collection, recruiting and coordination with states, input into reporting, and other administrative tasks.

Total Salaries:

Year 1: \$88,100    Year 2: \$105,163    Year 3: \$100,891    Year 4: \$100,094

**2. Fringe Benefits:**

25% of the personnel total (insurance @ 10%, pension @ 7%, and payroll taxes @ 8%).

Year 1: \$22,025    Year 2: \$26,291    Year 3: \$25,223    Year 4: \$25,024

**3. Travel:**

<b>CAST Travel Breakdown</b>					<b>Year 1</b>	<b>year 2</b>	<b>Year 3</b>	<b>Year 4</b>
<b>Map Working Session at KU</b>								
2 persons airfare \$500				\$1,000	\$0	\$0	\$0	\$0
2 persons hotel 1 night \$220				\$440	\$0	\$0	\$0	\$0
2 persons meals & incidentals \$130 x 2 days				\$520	\$0	\$0	\$0	\$0
	<b>Total Travel to KU for Map Mtg (Year 1)</b>			<b>\$1,960</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>

<b>Annual project mgmt. trip to MD - all 4 years</b>							
2 persons airfare \$500				\$1,000	\$1,000	\$1,000	\$1,000
2 persons hotel 1 night \$220				\$440	\$440	\$440	\$440
2 persons meals & incidentals \$130 x 2 days				\$520	\$520	\$520	\$520
	<b>Total Travel to MD for Annual trip</b>			<b>\$1,960</b>	<b>\$1,960</b>	<b>\$1,960</b>	<b>\$1,960</b>
<b>Travel to States for Iterative Development</b>							
<b>Goal 2 trip</b>							
<b>3 trips to New York (Albany), Year 2 and Year 3, 1pp, 1 night</b>							
1 persons airfare \$550 x 3 trips				\$0	\$1,650	\$1,650	\$0
1 person hotel 1 night \$220 x 3 trips				\$0	\$660	\$660	\$0
1 person meals & incidentals \$130 x 2 days x 3 trips				\$0	\$780	\$780	\$0
	<b>Total New York trips</b>			<b>\$0</b>	<b>\$3,090</b>	<b>\$3,090</b>	<b>\$0</b>
<b>3 trips to Maryland (Baltimore), Year 2 and Year 3, 1pp, 1 night</b>							
1 persons airfare \$550 x 3 trips				\$0	\$1,650	\$1,650	\$0
1 person hotel 1 night \$220 x 3 trips				\$0	\$660	\$660	\$0
1 person meals & incidentals \$130 x 2 days x 3 trips				\$0	\$780	\$780	\$0
	<b>Total Baltimore trips</b>			<b>\$0</b>	<b>\$3,090</b>	<b>\$3,090</b>	<b>\$0</b>
<b>Goal 3 trips</b>							
<b>2 trips to New York (Albany), Year 2 and Year 3, 1pp, 1 night</b>							
1 persons airfare \$550 x 2 trips				\$0	\$1,100	\$1,100	\$0
1 person hotel 1 night \$220 x 2 trips				\$0	\$440	\$440	\$0
1 person meals & incidentals \$130 x 2 days x 2 trips				\$0	\$520	\$520	\$0
	<b>Total New York trips</b>			<b>\$0</b>	<b>\$2,060</b>	<b>\$2,060</b>	<b>\$0</b>
<b>2 trips to Baltimore Year 2 and Year 3, 1pp, 1 night</b>							
1 persons airfare \$550 x 2 trips				\$0	\$1,100	\$1,100	\$0
1 person hotel 1 night \$220 x 2 trips				\$0	\$440	\$440	\$0
1 person meals & incidentals \$130 x 2 days x 2 trips				\$0	\$520	\$520	\$0
	<b>Total Baltimore trips</b>			<b>\$0</b>	<b>\$2,060</b>	<b>\$2,060</b>	<b>\$0</b>
<b>Travel for Dissemination (Y2, Y3 &amp; Y4)</b>							
<b>1 trip/year for 1pp x 1 night To Wash DC</b>							
1 persons airfare \$550 x 1 trips				\$0	\$550	\$550	\$550
1 person hotel 1 night \$220 x 1 trips				\$0	\$220	\$220	\$220
1 person meals & incidentals \$130 x 2 days x 1 trips				\$0	\$260	\$260	\$260
	<b>Total Wash DC trips</b>			<b>\$0</b>	<b>\$1,030</b>	<b>\$1,030</b>	<b>\$1,030</b>

**Travel Total**      Year 1: \$3,920      Year 2: \$13,290      Year 3: \$13,290      Year 4: \$2,990

**4. Equipment:**

N/A

**5. Supplies:**

We have budgeted \$250 per year in Years 1-4 to cover office expenses such as virtual conference costs, software licenses, and printing costs for project materials.

Year 1: \$250      Year 2: \$250      Year 3: \$250      Year 4: \$250

**6. Contractual:**

***Robert Dolan, Ph.D., Principal, Diverse Learnings Consulting.*** Dr. Dolan is an expert in applying Universal Design for Learning to the assessment of diverse learners in terms of both pedagogy and technology integration. He will utilize his 30+ years of experience in cognitive neuroscience, learning science, assessment, instructional design, and software architecture and engineering to meeting the goals and objectives of the proposed project, specifically as a key contributor to the Research Team. Should the project be funded, we have contracted with Dr. Dolan for an FTE of 30%/year for each of the project years at \$60,000/year. Total contract is \$240,000.

**Total Contractual:**

Year 1: \$60,000      Year 2: \$60,000      Year 3: \$60,000      Year 4: \$60,000

**7. Construction:**

N/A

**8. Other:**

Occupancy cost for direct cost of CAST staff is based on square footage. One full-time equivalent staff member uses 140 sq. ft. of usable space. Based on FTE/yr., occupancy costs:

Year 1: \$5,985      Year 2: \$7,581      Year 3: \$6,783      Year 4: \$6,384

**9. Total Direct:**

Year 1: \$180,280      Year 2: \$212,575      Year 3: \$206,437      Year 4: \$194,742

**10. Indirect:**

Indirect costs are budgeted at CAST's federally approved provisional rate of 42.2% of direct salaries and benefits.

Year 1: \$46,473      Year 2: \$55,473      Year 3: \$53,220      Year 4: \$52,800

**11. Training Stipends:**

N/A

**12. Total Costs:**

**Year 1: \$226,753      Year 2: \$268,048      Year 3: \$259,657      Year 4: \$247,542**

**Evaluation Budget for I-SMART  
BYC Consulting**

**Evaluation:**

Evaluation Questions	Evaluation Activities	Evaluation Timeline	Deliverable(s)	Estimated Evaluation Staff Time
Development of final evaluation planning	Development of the implementation checklist and review of project goals	Year 1	Implementation Checklist, recommendations for adjustments in program implementation	4 days

**Goal 1:** *Develop and evaluate a learning map model for science for students with significant cognitive disabilities.*

Evaluation Questions	Evaluation Activities	Evaluation Timeline	Deliverable(s)	Estimated Evaluation Staff Time
1. Is a cognitive map model to describe student (Goal 1) science learning produced?	Researcher logs, documents, and communication between states/researchers and, observation of the expert panel proceedings	Year 1	Implementation checklist update, document collection, panel recommendations and observation notes. Panel interview data.	7 days

**Goal 2 :** *Design, develop, and evaluate assessments that incorporate science disciplinary content and science and engineering practices in highly engaging, universally designed, technology-delivered formats*

Evaluation Questions	Evaluation Activities	Evaluation Timeline	Deliverable(s)	Estimated Evaluation Staff Time
2. Are valid, reliable, and “real world” usable “testlets” based on learning map models (Goal 2) developed for use in assessment for students in the target populations?	Documentation of literature review, update of theoretical framework, and Essential Element Concept Map in testlet development.	Year 2	Implementation checklist update, document collection.	4 days
	Documentation of testlet prototype.	Year 3	Researcher communications and testlet iterations.	2 days
	Structured telephone interviews with a sample of teachers implementing the prototype and final versions of the testlet	Year 3	Interview analysis and summary reporting	12 days

**Goal 3:** *Design, develop, and evaluate a dashboard that provides diagnostic feedback based on student performance on science assessments.*

Evaluation Questions	Evaluation Activities	Evaluation Timeline	Deliverable(s)	Estimated Evaluation Staff Time
3. Was a functional prototype of the data dashboard developed and tested with teachers?	Observation of dashboard trials, implementation checklist, documentation of dashboard iterations.	Year 3	Implementation checklist updates, observation notes and report	5 days

**Goal 4: Dissemination**

Evaluation Questions	Evaluation Activities	Evaluation Timeline	Deliverable(s)	Estimated Evaluation Staff Time
<p>4. To what degree do representatives from the participating states access and share information about the project?</p> <p>5. Do representatives from states believe that they played a valued role in the research project and that it produced significant results?</p>	<p>Focus group interview with state representatives (2) regarding the utility/applicability of the products developed.</p> <p>Frequency data collection from project website and social media platform.</p>	Years 2-4	<p>Focus group reports Years 2 &amp; 4.</p> <p>Spreadsheet and report of electronic access activity.</p>	6 days

**Reporting:**

Evaluation updates at six month intervals (4 days/yr.).  
 Final report at 58 months @ 6 days.  
 Implementation checklist updates quarterly (2 days/yr.).

**Total Days of Evaluation and Reporting, by Year:**

	Year 1	Year 2	Year 3	Year 4
Reporting & Planning	10	6	6	12
Goal 1	7			
Goal 2		4	14	
Goal 3			5	
Goal 4		3		3
Total	17	13	25	15

**Travel:** Travel costs are associated with on-site data collection in Baltimore, MD during evaluation planning (Year 1), learning map external review (Year 1), observations of dashboard tryouts (Year 3), and focus groups (Years 2 and 4).

\$1,200 x 5 (\$600 plane, \$400 hotel, \$200 food/other travel expenses) = \$ 6,000

Year 1= 2 travel days expense= \$2,400

Year 2= 1 travel day expense= \$1,200

Year 3= 1 travel day expense= \$1,200

Year 4= 1 travel day expense= \$1,200

**Totals:**

<b>Year</b>	<b>Evaluator Days @ \$980/day</b>	<b>Travel Days</b>	<b>Total</b>
<b>1</b>	<b>17 (\$16,660)</b>	<b>2 (\$2,400)</b>	<b>\$ 19,060</b>
<b>2</b>	<b>13 (\$12,740)</b>	<b>1 (\$1,200)</b>	<b>\$ 13,940</b>
<b>3</b>	<b>25 (\$24,500)</b>	<b>1 (\$1,200)</b>	<b>\$ 25,700</b>
<b>4</b>	<b>15 (\$14,700)</b>	<b>1 (\$1,200)</b>	<b>\$ 15,900</b>
<b>Total</b>	<b>70 (\$68,600)</b>	<b>(\$6,000)</b>	<b>\$ 74,600</b>

**Maryland State Clearinghouse for Intergovernmental Review (Executive Order 12372)**

**To submit a project, email us at [mdp.clearinghouse@maryland.gov](mailto:mdp.clearinghouse@maryland.gov) and for inquiries call (410) 767-4490.**



Jack R. Smith, Ph.D.  
Interim State Superintendent of Schools

200 West Baltimore Street • Baltimore, MD 21201 • 410-767-0100 • 410-333-6442 TTY/TDD • [msde.maryland.gov](http://msde.maryland.gov)

December 8, 2015

U. S. Department of Education  
OCFO/FIPAO/ICG  
Attn: Frances Outland  
550 12<sup>th</sup> Street, S.W.  
Washington, DC 20202-4450

Dear Ms. Outland:

Enclosed please find the countersigned original Indirect Cost Rate Agreement, reflecting the approved Indirect Cost Rates for fiscal year 2016. Additionally, I have enclosed the countersigned approval for a one-year extension to Maryland's delegated authority for calculation and approval of the local school system indirect cost rates.

Thank you very much for your assistance in resolving the FY 2016 rates and for the one-year extension to our delegated authority.

Please let me know if I can be of further assistance. I may be reached at 410-767-0011 or [kristy.michel@maryland.gov](mailto:kristy.michel@maryland.gov).

Sincerely,

Kristy Michel  
Chief Operating Officer

KM/km

Enclosures

C: Emily Wen

**INDIRECT COST RATE AGREEMENT  
STATE EDUCATION AGENCY**

**Organization**

Maryland State Department of Education  
200 West Baltimore Street  
Baltimore, MD 21201

**Date:** DEC 0 2 2015

**Agreement No:** 2015-136

**Filing Reference:** Replaces previous Agreement No. 2014-184

**Dated:** 2/6/2015

The approved indirect cost rates herein are for use on grants, contracts, and other agreements with the Federal Government. The rates are subject to the conditions included in Section II of this Agreement and regulations issued by the Office of Management and Budget (OMB) Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards under 2 CFR 200.

**Section I - Rates and Bases**

<u>Type</u>	<u>From</u>	<u>To</u>	<u>Rate</u>	<u>Base</u>	<u>Applicable To</u>
Fixed	07/01/2015	06/30/2016	15.2%	MTDC	Unrestricted
Fixed	07/01/2015	06/30/2016	13.5%	MTDC	Restricted
Fixed	07/01/2015	06/30/2016	16.0%	MTDC	DDS

**Distribution Base:**

**MTDC** Modified Total Direct Cost - Total direct costs excluding equipment, capital expenditures, participant support costs, patient care, pass-through funds and the portion of each subaward (subcontract or subgrant) above \$25,000 (each award; each year).

**Applicable To:**

**Unrestricted** Unrestricted rates apply to programs that do not require a restricted rate per 34 CFR 75.563 and 34 CFR 76.563.

**Restricted** Restricted rates apply to programs that require a restricted rate per 34 CFR 75.563 and 34 CFR 76.563.

**Treatment of Fringe Benefits:**

Fringe benefits applicable to direct salaries and wages are treated as direct costs. Pursuant to 2 CFR 200.431, (b), (3), Paragraph (i), unused leave costs for all employees are allowable in the year of payment. The treatment of unused leave costs should be allocated as an indirect cost except for those employee salaries designated as a direct cost for the restricted rate calculation.

**Capitalization Policy:** Items of equipment are capitalized and depreciated if the initial acquisition cost is equal to or greater than \$5,000.

## **Section II – Particulars**

**Limitations:** Application of the rates contained in this Agreement is subject to all statutory or administrative limitations on the use of funds, and payments of costs hereunder are subject to the availability of appropriations applicable to a given grant or contract. Acceptance of the rates agreed to herein is predicated on the following conditions: (A) that no costs other than those incurred by the Organization were included in the indirect cost pools as finally accepted, and that such costs are legal obligations of the Organization and allowable under the governing cost principles; (B) the same costs that have been treated as indirect costs are not claimed as direct costs; (C) that similar types of information which are provided by the Organization, and which were used as a basis for acceptance of rates agreed to herein, are not subsequently found to be materially incomplete or inaccurate; and (D) that similar types of costs have been accorded consistent accounting treatment.

**Accounting Changes:** The rates contained in this agreement are based on the organizational structure and the accounting systems in effect at the time the proposal was submitted. Changes in organizational structure or changes in the method of accounting for costs which affect the amount of reimbursement resulting from use of the rates in this agreement, require the prior approval of the responsible negotiation agency. Failure to obtain such approval may result in subsequent audit disallowance.

**Provisional/Final/Predetermined Rates:** A proposal to establish a final rate must be submitted. The awarding office should be notified if the final rate is different from the provisional rate so that appropriate adjustments to billings and charges may be made. Predetermined rates are not subject to adjustment.

**Fixed Rate:** The negotiated fixed rate is based on an estimate of the costs that will be incurred during the period to which the rate applies. When the actual costs for such period have been determined, an adjustment will be made to a subsequent rate calculation to compensate for the difference between the costs used to establish the fixed rate and the actual costs.

**Notification to Other Federal Agencies:** Copies of this document may be provided to other Federal agencies as a means of notifying them of the agreement contained herein.

**Audit:** All costs (direct and indirect, federal and non-federal) are subject to audit. Adjustments to amounts resulting from audit of the cost allocation plan or indirect cost rate proposal upon which the negotiation of this agreement was based may be compensated for in a subsequent negotiation.

**Reimbursement Ceilings/Limitations on Rates:** Awards that include ceiling provisions and statutory/regulatory requirements on indirect cost rates or reimbursement amounts are subject to the stipulations in the grant or contract agreements. If a ceiling is higher than the negotiated rate in Section I of this agreement, the negotiated rate will be used to determine the maximum allowable indirect cost.

**Section III - Special Remarks**

Alternative Reimbursement Methods: If any federal programs are reimbursing indirect costs by a methodology other than the approved rates in this agreement, such costs should be credited to the programs and the approved rates should be used to identify the maximum amount of indirect costs allocable.

Submission of Proposals: New indirect cost proposals are necessary to obtain approved indirect cost rates for future fiscal years. **The next indirect cost rate proposal is due six months prior to the expiration dates of the rates in this agreement.**

**Section IV - Approvals**

For the State Education Agency:

Maryland State Department of Education  
200 West Baltimore Street  
Baltimore, MD 21201

Kristy Michel  
Signature

Kristy Michel  
Name

Deputy Superintendent  
Title

12/8/15  
Date

For the Federal Government:

U.S. Department of Education  
OCFO / FIO / ICG  
550 12th Street, SW  
Washington, DC 20202-4450

Frances Outland  
Signature

Frances Outland  
Name

Director, Indirect Cost Group  
Title

DEC 02 2015  
Date

Negotiator: Emily Wen  
Telephone Number: (202) 245-8109

LOCAL EDUCATIONAL AGENCY  
DELEGATION AGREEMENT

ORGANIZATION:

Maryland State Department of Education  
200 West Baltimore Street  
Baltimore, MD 21201

DATE: DEC 0 2 2015

AGREEMENT NO. 2011-143 (A)

FILING REFERENCE: This replaces  
previous Agreement No.2011-143  
dated May 6, 2011

This Agreement confirms approval and acceptance of the methodology policy and procedures the State Educational Agency (SEA) will use in establishing indirect cost rates for their Local Educational Agencies (LEAs). These rates are for use in the award and management of Federal contracts, grants and other assistance arrangements governed by Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards 2 CFR part 200 and Education Department General Administrative Regulations (EDGAR) 34 CFR parts 75.561 and 76.561 (b) and (c).

The State Superintendent of Education or designated representative is delegated authority to establish indirect cost rates for LEAs in their State. These LEA rates will serve as the sole basis for budgeting and allocating indirect cost reimbursement under Federal programs. The application of LEA indirect cost rates is binding on all Federal agencies and subject to periodic review pursuant to single audit requirements for State and Local governments.

The effective period of this agreement is: July 1, 2015 – June 30, 2016.

For the State Educational Agency:

Kristy Michel  
Signature  
Kristy Michel  
Name  
Deputy Superintendent  
Title  
12/8/15  
Date

For the Federal Government:

Frances Outland  
Signature  
Frances Outland  
Name  
Director, Indirect Cost Group  
Title  
DEC 0 2 2015  
Date  
Emily Wen  
Negotiator  
202-245-8109  
Telephone Number