



A r i z o n a
Department of Education
REQUEST FOR INFORMATION

RFI # ADED16-0002

Issue Date: June 6, 2016

Description: Arizona School Accountability Components & System

Due date: July 15, 2016 **Time:** 3:00 p.m. (MST)

General Information:

In accordance with ARS §41-2555, the Arizona Department of Education (ADE) hereby gives notice via this Request for Information (RFI), of its desire to receive responses, feedback, suggestions and comments regarding the items set forth herein.

In accordance with R2-7-G301, responses to the RFI are not offers and cannot be accepted to form a binding contract. To the extent allowed by law, information contained in a response to an RFI may be considered confidential until the procurement process is concluded or two (2) years from when the RFI's due date has elapsed, whichever occurs first. Responders are solely responsible for expenses associated with responding to the RFI. The State is under no obligation to the responders in so far as the next steps to this process are concerned.

Responders are invited to respond to one, any, or all of the questions contained in the RFI.

Responses to the RFI shall be submitted as follows:

All informational documents in text or PDF format shall be submitted directly to ADE's Accountability Unit through its [online collection system](#) on or before July 15, 2016. Respondents shall receive a copy of their submission as successful receipt by ADE's Accountability Unit.

Confidentiality:

Any submitted materials considered by the respondent to be proprietary or confidential shall be clearly marked as such and provided as a separate section in your response. In response to such requests, the State will make reasonable efforts to maintain confidentiality of these materials to the extent permissible by law. However, should the State be required to release these materials, the State will provide the respondent reasonable notice in advance of doing so in order to allow the respondent time to take any action to prevent these materials from being released.

Clarification of Solicitation Requirements:

It is the responsibility of all Offerors to examine the RFI and seek clarification of any item or requirement that may be clear or unclear to them and to check all offers for accuracy before submittal to ADE.

Any questions regarding this solicitation can be answered by emailing the Arizona Department of Education Office of Procurement at Procurementinbox@azed.gov. All questions must be in writing. The ADE Chief Procurement Officer is the only authorized person to

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give information as to the requirements of the solicitation in addition to that contained in the written documents. **Questions should be emailed and received by Office of Procurement no less than seventy-two hours before the RFI due date and time.**

All questions must reference the page and item that is to be addressed.

Purpose:

The Arizona Department of Education (ADE) must develop and administer a fair and systematic high stakes accountability system using multiple measures adherent to state and federal requirements. This process will provide ADE and its group of technical and policy stakeholders access to innovative and diverse considerations in order to develop and recommend an accountability system with the highest level of integrity and transparency. **This RFI solicits feedback from interested parties with any relevant expertise, systems, or methodology they have developed or conceptualized which meet the intent of any one or more of the components described below.** If appropriate, ADE may include non-proprietary responses to this RFI as documented stakeholder engagement tools used to develop Arizona’s State Plan required by ESSA and/or a final A-F Letter Grade Accountability System Recommendation.

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Instructions for Responding:

Please frame responses to address requirements outlined by the Every Student Succeeds Act (ESSA), ARS §15-241, SB1430, the State Board of Education’s Principles of Agreement, Superintendent Diane Douglas’ *AZ Kids Can’t Afford to Wait* Plan, and other historical documentation (i.e. subcommittee minutes, archived materials, publicly available data sets, presentations, White Papers, etc.) which might impact the recommendation and/or adoption of any proposed system of holding Arizona schools and districts accountable.

All stakeholders with shared interest in the State of Arizona’s method of holding schools and districts accountable are encouraged to submit responses to one or all of the items below. Please provide answers to as many of the questions as possible and provide supporting materials that describe the proposal and any other related considerations. Partial responses must identify the specific item(s) the submission will address. The Department of Education will not grant access to student-level information for this RFI; respondents should reference existing publicly available aggregated data sets if needed. With the exception of proprietary or confidential information, all submissions to this RFI shall be made publicly available by the Department. Consequently, the Department will use peer review and/or statistical modeling to assess the fairness and viability of each relevant submission before inclusion in a high stakes accountability system.

This RFI is being issued to obtain information only and may or may not result in contracts or vendor agreements with any respondent. Respondents to this RFI will not be excluded from eligibility to participate in any future requests for proposals (RFPs) based on their decision to respond to this RFI or on the content of their responses to this RFI; however, respondents to this RFI will be excluded in evaluating and integrating responses which may or may not result in a high stakes accountability system and related competitions.

Information Being Requested:

1. Demonstration of values

- a) How does a transparent and fair accountability system define an “excellent” school in regards to:
 - i. Preparing all students for College/Career readiness
 - ii. Improving achievement and outcomes among student subgroups
 - iii. Graduating students prepared for postsecondary workforce and/or education
 - iv. Demonstrating growth on standardized assessments aligned to Arizona’s standards
 - v. Providing a high-quality, well-rounded education to families regardless of income
 - vi. Meeting the needs of parents and students in the community

Please see response to question 3.a.

- b) How does a transparent and fair accountability system define a “failing” school in regards to:
 - i. Preparing all students for College/Career readiness
 - ii. Improving achievement and outcomes among student subgroups
 - iii. Graduating students prepared for postsecondary workforce and/or education
 - iv. Demonstrating growth on standardized assessments aligned to Arizona’s standards
 - v. Providing a high-quality, well-rounded education to families regardless of income
 - vi. Meeting the needs of parents and students in the community

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- c) How does a transparent and fair accountability system differentiate among schools that are neither “excellent” nor “failing”?

Please see response to question 3.a.

2. Background

- a) Provide a brief history of the organization and its governance structure, if applicable, or provide a brief overview of the individual’s experience with accountability of K-12 public schools and districts

Education Analytics, Inc. (EA) was formed by Professor Robert H. Meyer in late 2012 with the objective of conducting research and developing policy and management analytics to support reform and continuous improvement in American education. This institutional mission – to identify ways that analytics can make education systems better – has been central to our work with the federal government, school districts, states, non-profits, and policymakers. EA serves as a partner, and not just a vendor, by engaging in hands-on analytics support and thought partnering around how to address potential shifts in the policy landscape. This entirely unique and collaborative approach is driven by EA’s greater desire to support the data analytic needs of education agencies and help students everywhere succeed.

EA is a 501(c)(3) non-profit organization headquartered in Madison, WI and employs 32 staff members including economists, data programmers, policy analysts, and support staff. Our deeply knowledgeable and experienced team provides clients and partners with multiple core services, including student growth metrics, education policy, and technical assistance. We not only offer a full range of education analytics knowledge to our partners to support new systems, but also strive to co-build each system with stakeholders to match the available data and meet the desired policy requirements.

- b) Identify the individuals from the organization that will be working with Arizona officials on all aspects of the accountability system’s implementation.

Ryan Reyna, President of Ryan Reyna Consulting, specializes in state-level multiple-measure accountability systems. Ryan most recently served as Director of the Office of Accountability and Data Management at the Delaware Department of Education. In that role, he led the state’s efforts to develop a new multi-measure accountability system, centralize the data reporting and analysis functions within the Department, develop its ESEA Flexibility Waiver renewal application, and annually report on Pre-K through higher education outcomes. Ryan has worked with EA on several projects in his areas of expertise including thoughtful use of outcomes measures aligning to state/federal guidelines, facilitation of stakeholder engagement sessions, and framing of technical analysis methods and results.

Robert H. Meyer, President and CEO of Education Analytics and research professor and director of the Value-Added Research Center at the University of Wisconsin-Madison. Before that, he was on the faculty of the Harris School at the University of Chicago and the Economics Department at the University of Wisconsin-Madison. Dr. Meyer is known for his research on student growth modeling and evaluation methods and is currently working intensively with school districts in Atlanta, Chicago, Hillsborough County (Florida), Los Angeles, Madison, Milwaukee, Minneapolis, New York City, and Tulsa; as well as with the states of Minnesota, North Dakota, South Dakota, and Wisconsin. Over the past two decades he has worked collaboratively with these districts and states to build value-added and performance management systems to inform decision making with respect to policy and school improvement strategies. He is co-leading a major initiative within Minnesota and the Dakotas (and their partner school districts) to provide value-added information to all teachers and to the colleges and universities that prepared these teachers. Dr. Meyer is currently working with many districts and states to expand value-added systems to include courses not typically covered by assessments under No Child Left Behind. He has conducted major statistical evaluations of programs and policies such as class size reduction, literacy, and Supplemental Educational Services. Meyer received a Senior Urban Education

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Research Fellowship from the Council of Great City Schools in 2007 and in 2010 received the University of Wisconsin-Madison, Chancellor's Award for Excellence in Research.

Andrew Rice, Executive Vice President of Research and Operations of Education Analytics. An economist, he leads EA's day to day operations and advises partners on policy implications of technical systems work. He works with school districts, state agencies, foundations, and national unions on developing and implementing analytics that support the education system. Dr. Rice has particular expertise in school accountability models, assessment data, educator impact measurement, student growth measurement, human capital management metrics and data systems.

- c) Disclose and discuss the organization's work within and around Arizona's state education agency, local education agencies, and/or public education agencies including assurance any work or deliverables produced by the organization will exclude bias or undue influence, if applicable.

Education Analytics has worked with Tucson Unified School District through spring 2016 and Mesa Public Schools until 2015, however we currently do not conduct any work within and around Arizona's education agency, local education agencies, and/or public education agencies that would exclude bias or undue influence.

3. Overview of System

- a) List and define the metrics included in a potential accountability system which meets the needs of Arizona's various school types and uses multiple measures. Please highlight the extent to which academic achievement on Arizona's statewide assessments (i.e. AzMERIT, NCSC, AIMS, etc.) and/or results from a menu of assessment can be meaningfully integrated in the proposed system.

At the most basic level, any successful state accountability system must at once serve three main goals:

1. Provide an easy-to-understand, transparent evaluation of school performance for parents, educators, policymakers, and the public;
2. Enable determinations for additional reward, support or consequence; and,
3. Support the continuous improvement of teaching and learning in schools.

For an accountability system to be "best in class," it should meet two additional goals:

1. Inspire and direct improvement toward college and career readiness for all students, and
2. Reliably measure the impact that a school has on its students, rather than the impact student characteristics have on school performance.

The following model aims to accomplish both the foundational and aspirational goals, while meeting all of the complexities of the Every Student Succeeds Act. This model is intended for illustrative purposes. Specific measures, weights and aggregation decisions will heavily depend on the values identified by ADE agency staff and stakeholders. The proposed model reflects each school's contribution to student achievement by:

- Placing the greatest emphasis on year-to-year progress;
- Emphasizing improvement of traditionally underperforming students; and
- Judging school performance in the context of similarly populated schools.

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Categories for Rating

The overall school rating is derived from performance in three areas of measurement:

1. Student Achievement
2. Student Progress
3. On Track to College and Career Readiness

Student Achievement

The Student Achievement category measures student performance in relation to grade level expectations. This area includes data from statewide assessments in three content areas (English/Language Arts, Math, and Science),¹ as well as information about early grade progress to demonstrate literacy and numeracy. Students that are performing on grade level have a greater likelihood of entry and success in education and career training beyond high school.

Student Progress

The Student Progress category measures how well schools are improving student learning over time. This area includes metrics on the collective performance of students within a school as compared to students with similar assessment history, the year-to-year improvement of the lowest performing students, the likelihood that students demonstrating proficiency will continue to do so in the future, and the progress students make in gaining English-language proficiency.

On Track to College and Career Readiness

The On Track to CCR category measures student advancement to high school graduation and beyond. The metrics in this area are leading indicators of future academic success and differ slightly by school level, including information on students’ attendance, course taking patterns, graduation and college and career preparation and transitions. Students that attend school regularly and complete rigorous courses have a greater likelihood of high school graduation. Students that complete postsecondary experiences early and seamlessly transition to their next education or training experience beyond high school are more likely to experience positive outcomes beyond high school.

Indicators

The following proposed indicators for the accountability system are intended to provide clear information about the achievement of all students and the progress of specific subgroups of students in a way that balances and takes account the variety of school populations across the state. Both schools with large populations of struggling students and those with large populations of advanced students can demonstrate successful performance on the following proposed indicators:

Student Achievement

- Proficiency ELA, Math, and Science – This provides information on the percent of students meeting grade level expectations. This can be measured based on current state assessments (e.g., AzMERIT, NCSC, AIMS) or any locally selected assessment approved by the state.

¹ Over time, the state could consider adding in Social Studies as well.



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- **Average Scale Score ELA and Math** – This provides information about the performance of students across the test scale. A focus on the test scale encourages support for all students, regardless of how close they are to the proficiency line. This can be measured based on current state assessments (e.g., AzMERIT, NCSC) or any locally selected assessment approved by the state through a statistically valid approach to link scales.
- **Early Grade Progress ELA and Math** – This provides information about the extent to which students in traditionally underserved populations meet third grade expectations, which is one of the most critical benchmarks on the way to high school graduation. Performance is weighted by each student’s unique demographics based on research from prior test history of similar students. For instance, an African American student could receive a different weight than an African American student who is also an ELL. Based on the historical probability of students meeting certain performance thresholds (which can change over time), individual students receive points for meeting or exceeding performance expectations. The information is aggregated at the school level.

Student Progress

- **Growth ELA and Math** – This provides the relative calculation of student progress in ELA and Math over time as compared to their peers at the school level. Growth is calculated using a value-added model, with controls for prior assessment history over multiple years and could control for student demographics (i.e., level of special education classification) and concentration of high-need students based on the policy decisions of the state. Growth would be included for all school levels and can be calculated across multiple tests and modalities.
- **Year-to-year improvement of lowest scoring students** – This provides information about relative progress of the lowest performing student cohort. This is measured by the percent of students (in both ELA and Math) that scored at Achievement Level 1 in the prior year and who demonstrate greater than one Achievement Level improvement in scale score (for instance, a low AL1 in year x-1 tests at a mid AL2 in year x). Again, the focus on scale improvement is intentional so that this indicator is not misconstrued as encouraging focus on students at the bubble, to the detriment of other low performing students. Any school with fewer than 20 students scoring at the AL1 level will have its 20 lowest performing students reviewed using a similar methodology.
- **Maintenance of Proficiency** – This provides information about the percentage of students currently proficient who are likely to meet the proficiency standard in the future. This is measured by calculating growth-to-proficiency for any student that met proficiency in the current school year. The proficiency target is established for three school grades in the future (or the 11th grade).
- **English-language proficiency improvement** – This provides information about the progress students make each year on the path to English-language proficiency. This is measured by a value-added growth calculation based on AZELLA.

On Track to College and Career Readiness – Elementary/Middle Schools

- **Chronic absenteeism** – This provides information on the percent of students that are missing substantial amount of school time. Students that miss greater than 18 school days are considerably more likely to struggle in school and fail to graduate on time.
- **Core course completion** – This provides information on the percent of students in grades 6-8 that pass all of their required core courses (i.e., ELA, Math, Science and Social Studies). Failing a core course in middle school increases the likelihood that a student may not graduate on time.

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- **Algebra I completion** – This provides information about the rigor of student course taking. This is measured by the percent of students earning credit in Algebra I before the end of 8th grade. Students that complete Algebra I before high school are more likely to complete rigorous coursework in high school and ultimately move on to education and training beyond high school.

On Track to College and Career Readiness – High Schools

- **On track in 9th Grade** – This provides information on the percent of students who are on track to graduate prepared for college and careers at the end of the 9th grade. This measure would be developed based on predictive analytic research into the performance and experiences that suggest a student is progressing on an appropriate trajectory toward college and career readiness. This could include components such as core course completion, discipline, defining academic and career goals, engagement in extracurricular activities, etc. This metric could also provide additional benefit to students that enter 9th grade behind and are able to get “on track” by the end of the school year.
- **4-year graduation rate** – This provides information about the percentage of 9th grade students who graduate high school within four years. Students that graduate from high school within four years increase their likelihood of entry and success in education and training beyond high school.
- **6-year graduation rate** – This provides information about the percentage of students who graduate from high school within six years. Some students take longer than four years to graduate from high school, including students that have a specific plan to extend their high school career, and schools should be rewarded for continuing to work with these youth to ensure they have diploma that will enable them to continue their education and training beyond high school.
- **College and Career Preparation** – This provides information about the percentage of students who have demonstrated preparation for education and career training after high school through SAT, ACT, AP, IB, transferrable dual credit, and industry-recognized credentials. Students that demonstrate early success in these areas increase their likelihood of entry and success in education and career training after high school.
- **College and Career Transitions** – This provides information about the percentage of students that successfully transition to education, training or the workforce after high school. Given that success beyond high school is the ultimate goal of K-12 education, schools should be recognized and held accountable for supporting student transitions to: 2-year and 4-year institutes of higher education, registered apprenticeship programs, certification programs of at least one year, military, or employment in a high-wage, high skill field.

Aggregation

Schools and districts receive an A-F rating based on performance in each category (e.g., Student Achievement, Student Progress and On Track to Graduation) and overall. Individual student data is aggregated at the school and district levels to generate a specific designation. This can occur mainly in one of two ways.²

² For additional optional approaches, see attached powerpoint slides.



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Index

Currently in use by many states, the index is the numerical aggregation of performance across the full spectrum of measures. The measures are often assigned a “weight” according to policy preferences. The index can be used to assign scores to groups of measures (i.e., performance on all state assessments) and/or the system as a whole.

- Pro: can maximize differentiation between schools and create rating threshold clarity
- Con: can minimize transparency of performance on individual measures and may be difficult to weight appropriately

The following provides a proposed set of weights for the categories and individual metrics, depending on the school’s grade configuration:³

<i>Metric</i>	<i>Points Possible</i>		
	<i>Elementary School</i>	<i>Middle School</i>	<i>High School</i>
<i>Student Achievement</i>	35	25	25
ELA – Proficiency	5	5	5
ELA – Scale	5	5	5
Math – Proficiency	5	5	5
Math – Scale	5	5	5
Science – Proficiency	5	5	5
ELA – Early Grade	5	NA	NA
Math – Early Grade	5	NA	NA
<i>Student Progress</i>	60	60	40
ELA – Growth	22.5	22.5	15
Math – Growth	22.5	22.5	15
Lowest Scoring Student Improvement	5	5	5
Maintenance of	5	5	NA

³ For the purposes of this demonstration model, schools are divided into 3 categories: Elementary (K-5), Middle (6-8) and High School (9-12). Additional weighting models will be necessary for K-8 and 6-12 schools, among others.



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Proficiency			
EL Proficiency	5	5	5
On Track to CCR	5	15	35
Chronic Absenteeism	5	5	NA
Core Course Completion	NA	5	NA
Algebra I	NA	5	NA
On track in 9th	NA	NA	5
4-year Grad	NA	NA	10
6-year Grad	NA	NA	5
C&C Preparation	NA	NA	10
C&C Transitions	NA	NA	5

Each of the metrics contributes a weighted value toward the numeric score, which is then converted into an A-F rating. Schools in the bottom 5% of ratings will be identified for comprehensive support.

However, it's important not to stop at a single overall rating. It is critical that each category of indicators is also rated, so that detailed information is equally accessible. If given the option between a B-rated school with high achievement and low progress and a C-rated school with low-to-average achievement and high progress, some parents may choose to send their child to the C-rated school. Similarly, strategies for supporting those schools by the district or state will look considerably different. Without additional differentiation at the category level, the accountability rating system may underserve parents and educators.

Matrix

Currently in use in a few states, the matrix reviews school performance in two domains, often status and growth (or progress). In this model, school ratings are based on where the school falls within each domain, rather than as a composite score of all metrics. Decisions must be made about which specific measures fall into the domains and whether one domain receives preference (or "weighting") when making determinations.

- Pro: can provide more transparency about the avenues of improvement of schools
- Con: can be more difficult to explain to stakeholders and harder to establish federal school classifications

The state could use the following model to display a school's performance on a graph of high, average, and low Status (the Student Achievement and On Track to CCR categories) vs. high, average, and low Progress (Student Progress category). This matrix model allows for a quick summary of where the school stands in relation to its peers (i.e., Level 4 Status and Level 2 Progress) and provides an overall A-F rating. The levels and related rating categories are provided for

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illustrative purposes. They should be determined according to SEA and stakeholder values and could change over time based on school progress.

Figure 1. Example of Matrix Aggregation

STATUS – Achievement and On track to CCR	5	C	B	B	A	A
	4	C	B	B	A	A
	3	D	C	B	B	A
	2	D	D	C	B	B
	1	F	D	D	C	C
		1	2	3	4	5
PROGRESS – Student Progress category						

A school could be designated for comprehensive and targeted support and improvement by defining the bottom left box (e.g., F schools) as the lowest 5% and through comparative peer performance (discussed below as an option in the Subgroup Performance section).

A Note of Caution Related to Weights

State accountability systems based on multiple measures (including all systems designed to meet the requirements of ESSA) will require the “weighting” of individual metrics to calculate a summative rating and determine which schools to identify for comprehensive and targeted support and intervention. In fact, ESSA calls for the first four accountability indicators to account for “much greater weight” than the fifth indicator (e.g., school quality or student success). Determining appropriate weights for each metric in the system is critical because it communicates to educators and public what type of performance the state values most. It is likely that decisions on metric weighting will require stakeholder engagement and potentially policy maker approval beyond the state education agency.

It is important to recognize that the term “weight” in this scenario is almost always referring to the policy weight assigned to a metric, which reflects system values (i.e., the state values growth more than proficiency) rather than the actual numerical weight of a metric. This ultimate value that a specific metric has in the overall calculation of performance is more affected by the spread of performance for that metric than the weight assigned in the system. An example of this phenomenon is provided below in Figure 2. The figure displays actual data from another state’s high school accountability metrics. Some of the metrics, like ELA and Math growth, have a large spread of performance, while others, like 4-year graduation rate and On track in 9th Grade, have relatively little spread. A state could assign significant “weight” in its accountability system to the 4-year graduation rate and On track in 9th Grade metrics (say 50%); however, because school performance is relatively clumped, very little differentiation as a result of those metrics would be available. Rather, the metrics with the greatest spread would most significantly contribute to the overall differentiation of school ratings.

There is a solution to avoid this scenario, but it too can lead to complications with the calculation and communication of ratings at the individual metric level. States can “standardize” (e.g., a statistical process to create spread in metrics, as demonstrated in Figure 3) all of the metrics in their accountability system, so that the “policy” weights chosen match the “numerical” weights in the overall calculation. Standardizing makes performance relative, and thus may “force” schools to the “bottom” of performance on a specific metric, even if the level of performance is acceptable. For instance, a



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school with a 70% 4-year graduation rate may receive little to no credit (or points) in the overall rating for that performance level if the metric is standardized and that is the lowest graduation rate in the state. However, this issue too can be corrected with additional statistical techniques. Thus, it is important to seek technical assistance (internal or external) on statistical weights regardless of the state's method for aggregation or calculation of performance for individual metrics.

Figure 2. Example of non-standardized high school accountability measures.

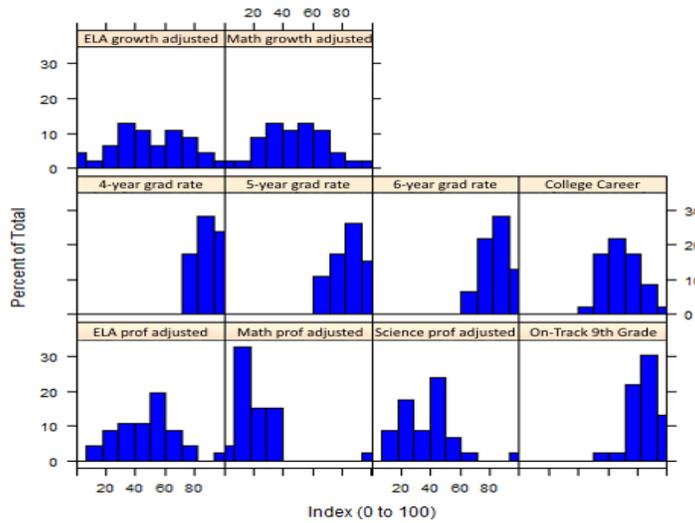
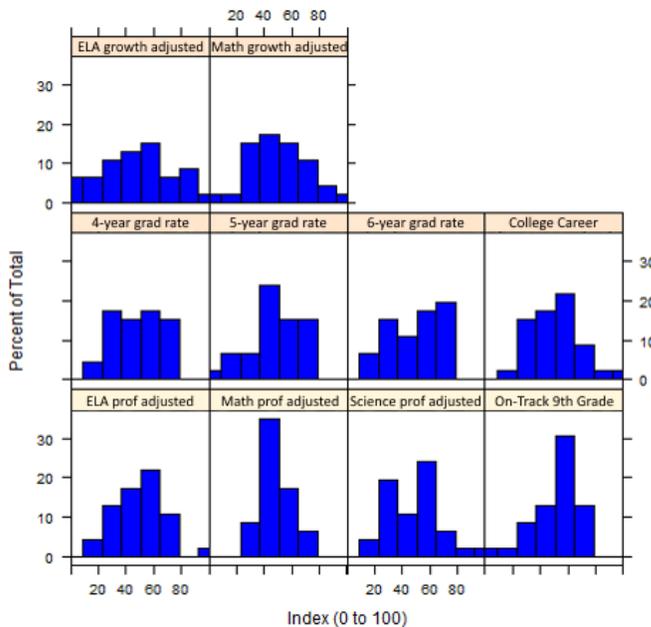


Figure 3. Example of standardized high school accountability measures.



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Subgroup Performance

The proposed accountability metrics aim to take into account performance of struggling students over and above the whole school performance. However, that may not be enough emphasis for ensuring that individual subgroups of students are not left behind. Thus, the state may choose to incorporate additional requirements for subgroup performance. One method for doing so would be to create a rule that any school in which a subgroup appears in the bottom 5% of performance statewide on any category of metrics (i.e., Academic Achievement) for three out of the most recent five years shall automatically receive an F letter grade and be identified for comprehensive support. A minimum N-size of 20 would need to apply for purposes of this calculation.

The state could also develop a peer comparison system to better take into account a school’s student population in devising school ratings. Using this method, each school's performance is compared to its nearest (~30) peers within the school level (i.e., High School). Peer schools are established based on similarity in student populations across four areas: Black or Hispanic race/ethnicity, English Learners, special education, and low-income status. Any school that performs in the bottom 5% of overall performance as compared to its peers could be eligible to be identified for targeted support. The state’s Secretary of Education could select schools for additional support and intervention from this list based on the extent of achievement gaps and chronic underperformance.

Additional Data for School Report Cards

ESSA places restrictions on the measures that states may include in accountability rating systems. The measures must be available statewide on an annual basis and disaggregated. This is a lofty goal and necessary for ensuring that the performance of our traditionally underserved students is not lost, and yet it does limit the extent to which states can use whole-school measures of performance in their formal accountability ratings.

For instance, student and teacher surveys are supported by over a decade of research indicating that they are correlated to student achievement. Unfortunately, use of those surveys does not appear to be eligible according to the letter of ESSA. It is exceedingly difficult to imagine disaggregating anonymous teacher responses by the subgroups of children they teach. School Quality reviews (or sometimes know as inspectorates) are another great example of a measure that provides important information about the school’s ability to support all students in their opportunity to learn. Once again, the limitation on disaggregation as well as the challenge of operationalizing a system of reviews for all schools on an annual basis makes it challenging to see how this would be allowable according to ESSA.

Be it through state report cards and/or direct interactions with school and district administrators (both are preferable), states should push forward on whole-school measures of performance. It is important not to forget that student performance is shaped by an individual’s interaction with the system around them – the climate, expectations, and supports that can be tracked to ensure that all schools are focused on improvement.

In addition to the measures that are used to determine a school’s accountability rating, states should publicly report on indicators that provide additional context for school performance. Recommended indicators include:

- Student, Parent and Teacher Surveys – Information on components of school success including effective leaders, collaborative teachers, involved families, supportive environment, and ambitious instruction.
- School Quality reviews – Information on a school’s organization to support student learning.

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- Kindergarten Readiness – Information on student’s readiness for school upon entry.
- Percent of students completing required core credits in 9th grade – External validation of student preparedness for the rigors of high school. This measure also takes into account students that drop out prior to completing 9th grade.
- Percent of students completing career interest survey – The extent to which students are exposed to future career opportunities. This allows students to take greater control of their education and training.

Further, the best systems will transparently report comparison information about school performance, including performance in each category and overall for the previous two years, performance at the district and state levels on each indicator, the performance of the average peer school on each indicator, and how each school’s category and overall ratings compares to its peer schools (i.e., bottom or top 10% of its peers).

- b) Describe how the proposed metrics are aligned to college / career expectations and include any alignment studies, if available.

Please see response to question 3.a.

- c) Describe how differentiated weights and metrics resulting in an overall letter grades can be compared between schools and across years to inform the following:
- i. Achievement of all students and progress of student subgroups
 - ii. Information needed by parents/communities to inform school choice
 - iii. Improvement of various types of schools within Arizona
 - iv. Construct relevant components of school quality

Please see response to question 3.a.

- d) Describe how the proposal may reduce administrative burden for LEAs and the SEA given the variation in accountability requirements related to applicable federal laws, state laws, State Board of Education rules, charter school authorizers, and other regulatory bodies.

The submission does not address this question.

4. Measuring Student Growth

- a) What are the advantages of utilizing this measure of growth on Arizona’s statewide assessments and in Arizona’s new A-F Letter Grade Accountability System?

Growth scores are a critical component to any accountability system. How the multiple components of such a system are aggregated, weighted and communicated can take many forms. To introduce or include a growth measure in the system helps to ensure a more accurate and fair measure of the impact of all districts, schools and teachers. By accounting for the starting point of students and reviewing the same students at a later date, we can accurately measure growth or the true impact educators had on that students learning. When including growth into an A-F representation or any 'bucket' representation of accountability, model choices to consider include whether or not to use point estimates or to also include confidence intervals. Only providing point estimates, while easier, runs the risk of perhaps assigning too much credit or too much blame to smaller districts and schools; as the smaller size school can often produce a point estimate that is not statistical significant. Including confidence intervals in the measure addresses this issue, but does increase explanatory challenges around the model and by design does produce less 'actionable' data. However, with the use of

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confidence intervals in making assignments to 'buckets', decision-makers and other consumers of the information are interpreting results that are more statistically accurate and stable.

- b) Please discuss evidence of technical appropriateness and statistical robustness to support the validity and reliability of student-level growth scores based on each of the following assessment scenarios:

As a full-service thought partner, EA takes pride in not only providing a technical rationale for each growth model decision point, but also provide information about potential policy impacts of those decisions. We call this “technical validity” and “consequential validity” and they are defined as such:

- Technical validity - the degree to which the statistical model and data used in the model provided consistent & unbiased estimates of performance using the available student outcomes/assessments
- Consequential validity – the incentives and decisions that are triggered by the design and use of performance measures and performance systems

One of the key elements of creating a robust growth measure is the assessment used to measure student growth. Not only should the assessment instrument itself need to align to the curriculum taught by educators, but there needs to be a sufficiently large group of students across schools and districts to use as a reference group. Additionally, an assessment must be able to differentiate performance of students of varying performance levels – a property that some “mastery” assessments lack.

In the cases below, EA highlights some of the key findings and considerations from its work across the country.

- i. Vertically scaled assessments of grades 3 through 8 ELA standards

Typically, vertically-scaled assessments used for growth models in grades 3-8 in ELA are state assessments or other well-established 3rd party assessments such as the NWEA MAP or RLI STAR. These assessments generally behave well in growth models, tending to exhibit the right characteristics for a robust model, including:

- Content alignment to standards (growth on these assessments are sensitive to instruction by educators)
- Large and varied reference groups due to widespread implementation within or across states (allows for comparison to “similar students” in relative growth models)
- Generally designed to differentiate student knowledge rather than only measure mastery (especially in well-designed computer-adaptive implementations)
- Sequential annual administration of same-content test (allowing for growth from Spring-to-Spring or Fall-to-Spring in the same content area)

Student growth models such as Student Growth Percentiles (SGP) or Value-Added (VA) do not require vertical scaling to be effective as they both can be implemented to account for inconsistency test scales. Growth models in grades 3-8 ELA are used extensively across the country at the state level as well as the district level. Typically, growth models will only be implementable from grades 4-8 in the case of annual testing, due to the need for pairs of tests (starting knowledge and ending knowledge).

EA’s team team has extensive experience developing and implementing such methodologies (states such as Delaware and Michigan, districts such as New York City, Chicago, and Los Angeles).

- ii. Vertically scaled assessments of grades 3 through 8 Mathematics standards
Same principal applies as with our answer for 4.b.i

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- iii. Vertically scaled, non-sequential with extreme variability in the instructional format for end of course assessments of high school ELA and Mathematics standards

One of the challenges for High School ELA and Mathematics models (as opposed to elementary / middle) is the variability in test-taking pattern of students, particularly within the Mathematics track. Even in the event that there may be a statewide or district-wide end of course assessment, not all students may take the assessment during the same grade level, and thus students may have a variety of prior tests to use as predictors of performance. Also, students may increasingly begin repeating grades, particularly 9th grade depending on district grade-level promotion policies.

EA’s team has experience designing and implementing growth models for courses such as “Algebra I”, “Geometry”, “Algebra II”, “English II”, “English III”, etc. in districts such as Tulsa, OK and Los Angeles, CA. Extra care must be taken in these models to appropriately measure student growth for students taking different test patterns.

In the event that end-of-course assessments are not used commonly across schools or districts, comparability of assessment results is compromised and meaningful growth models prove difficult or impossible due to lack of suitable reference groups.

- iv. Across test administration modality (Paper and computer-based) equated on a common vertical scale in each of the subjects above

This is possible as long as procedures were in place to ensure a common experience for students between the form modalities and equating was performed adequately. It is advisable for a growth model provider to run diagnostic checks to determine whether the results of each administration method are comparable rather than solely relying upon test vendor assurance of equating. Diagnostics can include checks on each assessment’s results such as investigation of floor/ceiling effects in scores, comparing score distributions, etc. On growth model results, diagnostics should be performed to ensure that students taking a particular administration method did not systematically outperform the other. If discrepancies exist, it may be necessary to treat the administration methods as different assessments and model each administration pattern separately.

EA has had experience working with this situation with Tulsa Public Schools and districts in New York specifically with the NWEA assessment suite. In this situation students transition from Map for Primary Grades (MPG – an audio assisted assessment) to regular MAP (a computer administered assessment). In this situation we were able to analyze and determine solutions to a scale that may not be vertically or horizontally equated between these administrations even with an officially equated scale. A difficult portion of this work was that certain students in a school or class may have taken a different administration (as opposed to whole schools at a time). EA successfully created growth measures in this situation that had similar technical characteristics to the standard assessment.

- v. Varying assessments selected off of a menu of assessments potentially available in high school grades and administered in various modalities

EA would need to quantify the types of assessments and modalities at the high school grades to determine validity and reliability of student assessment scores. In some cases, states (such as New York) provide a list of

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“approved” assessments that schools and districts can choose from. Considerations for content alignment, test scale properties, psychometric evaluation results, fidelity of implementation requirements, and other factors should be considered for an assessment to be included on the “menu”.

To promote comparability of growth scores, limiting the menu of options is also advisable. Fully comparable systems do not allow for choice (such as those run on a single mandated state test). A menu of choices can introduce biases in the results that may or may not be distinguishable from true differences in performance across schools and districts. The ability to equate growth model scores across schools and districts may depend on the types of students taking the tests, how widespread the use of each menu choice is, and other factors. These topics create technical as well as communication challenges. Using a menu of assessments and various modalities increases growth model complexity and we would need to work closely with the ADE to determine the best possible solution.

- vi. Varying assessments selected off of a menu of assessments potentially available to students in elementary grades and administered in various modalities

Please see material from 4.b.v

- vii. Annual tests of English language proficiency as measured by AZELLA administered in Grades K through 12

Based on the information provided here: <http://www.azed.gov/assessment/azella/>, AZELLA may be good candidate for determining validity and reliability of student growth scores. This assessment meets both state and federal requirements to measure students' English language proficiency and they are taken during designated during the year with reassessments occurring once per year until the student achieves proficiency. This provides a good pretest/posttest relationship. Another factor would need to consider is the amount of students that take the AZELLA test. 2013 –14 numbers indicate that 85,000 Arizona students are ELL's. The more students available in the sample increase the validity and reliability of student growth scores.

EA has experience with SGPs using the WIDA assessment and have determined that with good measurement, good growth measures can be created on ELP assessments.

- viii. Summative assessments of Science standards administered to students enrolled in grades 4, 8, and high school

Especially in grades 4 and 8, these models are typically accomplished by using the prior year's math and reading scores as a predictor of student achievement on the Science assessment. A growth model provider should run diagnostic checks to ensure that prior math and reading results are sufficiently related to students' science scores to act as good predictors to allow for such a model. In high school, the added complexity of test-taking patterns comes into play, but may also be possible.

- c) Please describe the organization’s professional experience and technical capacity for conducting this type of work on behalf of education agencies locally, nationally, and/or internationally.

EA staff have worked with states and districts on student growth metrics for over 25 years in some of the highest profile and complex situations the field has seen. These include large consortium or state growth models in New York, California, Wisconsin, Michigan and Delaware; large urban districts with intense political pressure like Chicago Public Schools, New York City DOE, Los Angeles Unified School District, Hillsborough County Public Schools, Atlanta



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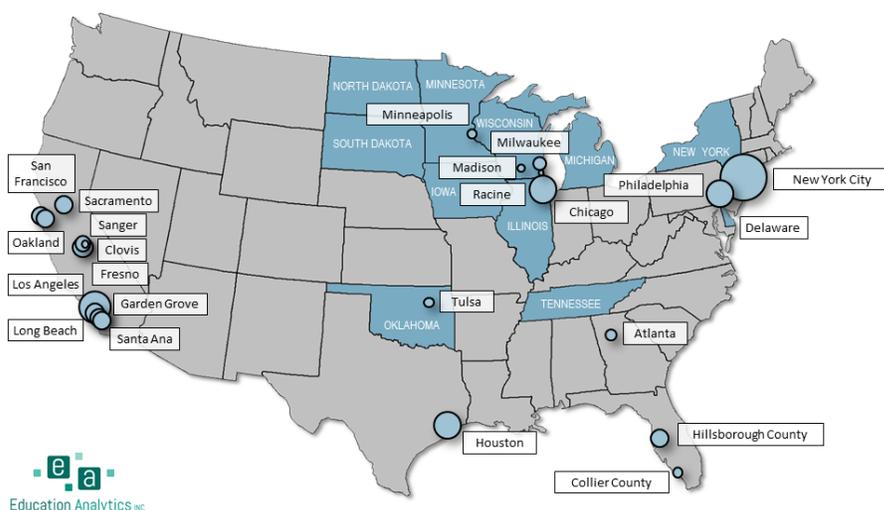
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Public Schools and Tulsa public schools; as well as large research studies across multiple states for the Federal Department of Education, Walton Foundation, Bill and Melinda Gates Foundation, and the Spencer Foundation.

Districts and States Where EA Team has Worked on Student Growth Models



We are considered one of the leaders in the country in co-developing student growth models for particular stakeholder needs. We bring key staff (Dr. Robert Meyer and Dr. Andrew Rice) whom are nationally known experts in growth modeling and policy making as well as internal advisory staff with experience leading or implementing state accountability systems (Ryan Reyna).

Our areas of expertise include:

Student Growth Metrics: Student growth metrics, created in collaboration with our partners, calculate the academic growth of students over time. We provide objective measures of how much progress can be attributed to teachers and schools, separate from other factors that affect students' learning. We also examine how student growth measures interact with other measures of effectiveness in improvement and evaluation plans. Given our work with a range of state, district, and local partners, we have extensive experience using multiple growth model methodologies, including Value-Added Metrics and Student Growth Percentiles.

Analysis Replication: One key component of our work is to replicate and implement previously developed data analytics in state, district consortium or large district education systems in high stakes environments. Our staff works with partners on a range of replication options, from general accountability system business rules replication with 100% data match to growth model replication with 100% data match.

Data Manipulation: Our staff work with student-level datasets ranging in scope from single charter schools up to full statewide student information system contents. In order to perform the analyses districts and states need, our analyst team creates datasets following comprehensive data cleaning and business rule implementation. Our IT infrastructure is built to handle processing of these large files in order to run efficiency optimization code to pinpoint which parts of the code take the longest to run so the team can focus effort on modifying those parts of the process to reduce runtime.

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Education Policy: We work with our partners to weigh the benefits of education policies, tools, and systems. We use data to review potential outcomes of policy decisions, to see how students or educators may be affected, and to proactively identify unintended consequences of policies and systems. We also support partners in considering how analytics can inform human capital management policies, including: recruitment/selection, professional development, compensation, and career progression.

Technical Assistance: Through our technical assistance efforts, we work with our partners to understand and implement metrics and analysis in their organizations. Our services include in-person trainings, workshops, online videos and tutorials, consultative sessions, and more.

Assessment Development: We work with districts to develop teacher-created assessments for use in Student Learning Objectives (SLOs) and other student growth models. EA’s process involves training, blueprint/item creation, psychometric analysis of pilot item results, and compilation of test forms from validated items. Through these services, teachers collaborate with colleagues about standards-based instruction and create high-quality assessments aligned to their instruction.

- d) Describe any services or assistance the vendor might provide to expedite the calculation of student growth scores so they are available to ADE, schools, students, and parents via student score reports produced by Arizona’s test vendor(s).

The process of expediting the calculation and delivery of growth scores begins with a thorough understanding of the data and business rules needed to support the growth model. An interactive, co-build approach to model development from the outset of the project will allow ADE and the vendor to clearly identify needed data, and determine if the existing infrastructure supports the efficient collection of data. In addition to identifying data needs, close cooperation on the development of business rules is essential. The planning process for data and business rules is the best way to ensure a timely process for the calculation and delivery of growth score results.

The co-build process also presents opportunities for greater stakeholder engagement in both the model-development process and decisions around usage. Getting early feedback from a broad cross section of stakeholders will improve the design of reports and also allow for improved professional development / communications around those reports, as both ADE and the vendor are able to capture user input from the inception of this work.

- e) How can parents, teachers, students, and schools use growth score(s) to interpret individual student trajectory relative to Arizona’s academic standards?

When communicating information around the interpretation of growth scores, it's important to arm stakeholders with the critical information needed to understand the objectives and key concepts behind growth models including: (1) what the model is measuring, (2) how the model works, and (3) why growth measures are included in accountability systems. You need to be highly transparent in model decisions for both knowledge transfer and credibility reasons. To this end, we also involve parents, teachers, and union groups in the co-build process to ensure all stakeholders have a voice, understand the decisions made on growth scores, and how to interpret the results.

- f) How can growth scores be aggregated and integrated into accountability determinations which may include varied weighting of proficiency results and other indicators of school performance?

See the previous discussion of aggregation methods – indexing and matrix approaches—in response to question 3.a.

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5. Other Technical Considerations

- a) Describe any detailed analyses currently available or could be conducted to support the validity, reliability, and fairness of a proposed system as well as the methodology and validation process for standard setting the overall A-F letter grade determinations. The ADE will model all components for possible inclusion in a final accountability system.

We believe and engage in developing analytics through a “system co-build” which actively involves our partner and the stakeholders they bring into the process in making decisions related to modeling, business rules, and reporting results. Our mission is to customize a model to address challenges faced by a district or state. The co-build process further ensures that the final model meets not only rigorous technical specifications, but also the policy and communication needs of the district or state. In addition, we build acceptance in the “system co-build” approach by conducting beta analyses on historical data to ensure we are addressing all aspects of model development.

How do we determine high quality versus low quality growth metrics? One method EA has used with its CA CORE partner is model neutrality. In order to do this we calculate correlations between growth estimates and school-level pretest/demographic covariates. This is a method for validating whether the variables we include on the right-hand side of our regression adequately control for school-level factors influencing growth percentile estimates. These correlations we deem “model neutralities;” the higher the correlation magnitude, the higher the level of “non-neutrality” for that particular covariate. In our modeling specification we do not include racial or ethnic demographics, but we do correlate school estimates with them to ensure model neutrality with respect to these variables.

We also draw a distinction between errors of covariate inclusion and exclusion: what we label errors of omission and commission. An error of omission is the same as omitted variable bias in classic regression analysis. Estimation results are inconsistent due to correlation between right-hand side regressors and the model error term. An error of commission, conversely, ascribes too much predictive power to included covariates. It essentially papers over true differences in school quality by ascribing these differences to included covariates.

This error can occur because of the presence of school effects in the second level of the regression. For instance, if we control for school-wide averages of economic disadvantage, we could potentially be ignoring the fact that schools with higher proportions of economically disadvantaged students produce lower student growth in test scores than schools with lower proportions of economically disadvantaged youth. This may be due to more inexperienced teachers being assigned to schools in low-income areas, resources available at the school, or for other reasons.

How do we confirm reliability and fairness of the accountability system? One method that we used in supporting the development of the Delaware accountability model was to test for the correlation between poverty status and final summative rating. It is critical that a multiple measure model of accountability goes beyond simply identifying those schools with the highest levels of low-income students as the schools most in need of interventions. Additional analyses included examining: potential year-to-year reliability, accuracy in the apportionment of metric “weights,” and comparisons of performance expectations and summative ratings across school levels (i.e., elementary vs. middle school).

- b) Describe the timeline necessary to produce school accountability ratings which will differentiate and support the variety of public schools and districts within Arizona.

In an effort to understand the timeline necessary to produce school accountability ratings you need to take into account and digest all stakeholders needs, design of the system that meets or exceeds expectations, and purposefully walk through all the steps in the process; from preliminary analysis to final implementation.

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We are driven by a philosophy that every situation is different and that it is impossible for an outside institution to know what is a best solution without our education partner having significant policy input. In particular, we drive development through a “policy goal first” philosophy by which we work with our partners to determine the desired outcome and then design statistical models to meet these needs.

Stakeholder involvement is at the core of our mission; we believe that every group that will use resulting data analytics should be involved in the design process. This does not mean that we design by committee; sometimes there is a technically right and wrong answer; however, in cases where a solution is policy preference-based, we act as facilitators for all of the stakeholder representatives. This process can be lengthy and involved but it's important to have the "buy-in" necessary to produce statewide school accountability ratings.

As an example, the design phase of Delaware’s accountability system (including specific growth model decisions) spanned 6 months and the calculation and delivery of school accountability ratings (including the production of growth data using a new value-added model) was completed 2 months after the receipt of student assessment information.

- c) Describe the level of complexity and ability to replicate the statistical techniques which may be utilized throughout the system to differentiate school performance.

The complexity around replication of statistical techniques that will be utilized throughout the system to become sustainable within the ADE can be attained.

To replicate statistical techniques, one needs to first understand and standardize the processes. By doing so, you 1) develop consistency that a deliverable will be completed the same way every time, 2) ensure that the deliverable meets expectations, 3) maximizes team impact and minimizes wasted effort through the use of technology and documentation, 4) provides accountability.

This standardization can take many forms however our "system co-build" approach allows districts and states the opportunity to identify and understand the level of effort, personnel/resources needed, and system(s) needed while working in this collaborative process.

In order to build internal capacity to replicate the statistical techniques for growth, we recommend the following roles are established and have gone through or are going through our "system co-build" approach.

Staff

- Data Analyst(s)
 - to inhale the statistical techniques, knowledge transfer – including document, in detail, the standardized processes
- Economist(s)
 - with a background in economic modeling to help support, modify, validate statistical techniques
- Psychometrian(s)
 - with a background towards growth measures

By going through the standardization of the processes with a thought partner, it allows the ADE to understand all components and pitfalls with replicating statistical techniques.

Depending on the complexity of the accountability system selected, the calculation (and future replication) of accountability ratings can be completed by data analysts with moderate statistical backgrounds. Processes to calculate the school ratings can completed in whatever statistical language ADE prefers.

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- d) Describe any resources related to personnel, data, and/or technology the proposal may require, including any additional resources, data collection, management, and storage needed by the Department.

Resources related to personnel, data, and/or technology to support this work can be addressed upfront or in a phased approach depending on the needs of the ADE.

Regardless of the timing to build internal capacity, having the resources outline in 5c as well IT, policy experts, professional development and project management staff in place to support technical, political and communication needs of the program would be recommend.

In addition, having a data warehouse that stores all disparate district and state data as well as open source statistical and reporting systems would allow for quicker transition to internal capacity

- e) Please highlight any significant deviations from previous practice or changes to operational definitions currently utilized within Arizona’s system of holding schools accountable.

As stated earlier, we believe and engage in developing analytics through a “system co-build” which actively involves our partner and the stakeholders brought into the process to assist making decisions related to modeling, business rules, and reporting results. We adjust our approach to avoid significant deviations or changes to operational definitions that may be currently utilized with Arizona's system of holding schools accountable.

PLEASE COMPLETE THIS FORM AND SUBMIT THE COMPLETED FORM WITH YOUR RESPONSE TO THE RFI.

We Andrew Rice and Ryan Reyna the undersigned, do hereby submit this response for information with regard to Arizona’s Statewide School Accountability System in accordance with ARS §41-2555 Request for Information specification contained herein.

Andrew Rice / Ryan Reyna
Name

7/15/16
Date

Education Analytics / Ryan Reyna Consulting
Company

President / Vice President
Name Title

131 W Wilson St #200, Madison, WI 53703
Address

608-466-4966
Telephone Number