

TO: Members of the Indiana State Board of Education
FROM: Claire Fiddian-Green and Danielle Shockey
SUBJECT: GROWTH CALCULATION FOR 2014-2015
DATE: July 9, 2014

Pursuant to federal ESEA flexibility waiver principles, Indiana statute and State Board of Education ("Board") regulation, Indiana is required to utilize growth as part of A-F school and school district accountability, and to utilize both student achievement and growth for purposes of teacher evaluations. These requirements apply to the 2014-2015 school year as Indiana implements the ISTEP+ and the End of Course Assessments aligned with the 2014 Academic Standards for English/Language Arts and Mathematics.

Dr. Damian Betebenner, an associate at The National Center for the Improvement of Educational Assessment in Dover, New Hampshire, who advised Indiana on the creation of the Indiana Growth Model, and who is under contract with the SBOE to advise on modifications to the state's A-F school accountability system, has advised CECI and the IDOE that growth may be calculated utilizing data from the 2014-2015 ISTEP+ assessment using an equi-percentile concordance analysis that will be both valid and reliable.

In the attached memo, titled "Future Directions for Student Growth in Indiana," Dr. Betebenner notes the following:

"Because the 2014-2015 College and Career Ready Assessment will have a different scale than the current ISTEP+ assessment, standard analyses will not allow current SGP calculations to be used in the coming year.

"However, there are two ways that analyses almost identical to these can be performed in the coming transition year: (i) Calculate scale score targets in the coming year using that data (instead of using the previous year's data) and then calculate the percentage of students in a school (or in any group) that met or exceeded their target. (ii) Calculate the scale score targets using the current data and use an equi-percentile concordance in the coming year to find the next year's scale score associated with the target so that a percentage of students exceeding their target can be calculated."

Dr. Betebenner spoke with CECI and IDOE staff via conference call on June 23, 2014. During that call, CECI and IDOE staff mutually agreed that Option 1 (ii) complies with HEA 1427, and will allow the greatest level of stability for students, educators and schools as Indiana transitions to assessments aligned with new college-and-career ready standards.

Therefore, CECI and IDOE staff jointly recommend that the Board approve the Option 1 (ii) growth calculation recommended by Dr. Betebenner for use in 2014-2015.

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Based upon recent and anticipated changes to the ISTEP+ student assessment and A-F accountability system, the state has investigated various options regarding changes to its current analysis of student growth. Specifically, for the 2014-2015 academic year, Indiana will transition to a new assessment based upon a new set of state defined standards. Transitioning to a new state assessment based upon new standards presents several challenges as states attempt to maintain their accountability systems that were built upon an assessment that will no longer exist. In particular, states like Indiana for whom student growth has become an integral part of their accountability system are confronting several issues associated with maintaining student growth analyses. This memo provides a brief overview of the options available to the state for maintaining student growth.

One consequence of transition to a new assessment is that Indiana will no longer have a common scale that can be used to compare scores from one year to the next. In particular, the vertical scale that Indiana currently has with its ISTEP+ will not be carried forward so that scale score gains/losses cannot be computed.¹

At a June 16th, 2014 meeting a comprehensive list of 5 options for calculating student growth from the 2013-2014 ISTEP+ assessment to the 2014-2015 College and Career Ready assessments was presented by the Indiana Department of Education:

1. 1 Year Projected (Currently used in A-F)
2. Targeted Growth
3. Categorical Status
4. Student Growth Percentiles
5. Improvement

Option 1: 1 Year Projected utilizes student growth percentile (SGP) calculations from the current year to establish scale score targets in the coming year allowing the state to determine the percentage of students in a school (or in any group) that met or exceeded their target. Because the 2014-2015 College and Career Ready Assessment will have a different scale than the current ISTEP+ assessment, standard analyses will not allow current SGP calculations to be used in the coming year.

However, there are two ways that analyses almost identical to these can be performed in the coming transition year: (i) Calculate scale score targets in the coming year using that data (instead of using the previous year's data) and then calculate the percentage of students in a school (or in any group) that met or exceeded their target. (ii) Calculate the scale score targets using the current data and use an equi-percentile concordance in the coming year to find the next year's scale score associated with the target so that a percentage of students exceeding their target can be calculated.

Option 2: Targeted growth utilizes student growth percentile (SGP) calculations from the current year to establish scale score targets in the coming year that indicate whether the student is on track to reach/maintain progress toward the next higher achievement level within three years. Because the 2014-2015 College and Career Reading Assessment achievement levels have not been set yet, these calculations are not possible until after two consecutive years of data from the new test are available to chart student progress toward higher levels of achievement.

¹ Even with a common (vertical) scale from year to year, growth norms are desirable in a similar way that height and weight norms are popular in communicating infant stature to parents.

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Option 3: Categorical Status change, often referred to as value-tables, is a method of examining student progress by looking at growth based upon changes in the performance levels of students from one year to the next. Based upon the observed changes, students are awarded points (more points for more desirable changes) and those points are used to create summaries for schools or other groups of interest. Because the performance levels on the new test have not been established, values associated with the value-tables would not be able to be established until the new test is given and results are available for examination. Similarly, in the 2015-2016 school year, the second year of the College and Career Ready Assessment, values associated with the value tables would have to be re-established because students would no longer be transitioning from the ISTEP+. Because performance standards are expected to be higher on the new assessment, it is likely that the state would have to give points to students dropping achievement levels (e.g., from proficient in 2013-2014 to did not pass in 2014-2015) which might present communication challenges.

Option 4: Student growth percentiles are currently used in approximately 20 states that are transitioning to a new assessment (and are the foundation of the metrics discussed in Option 1). SGP calculations are based upon an analytic technique that is invariant to monotone transformations of scale (Betebenner, 2009). As such, SGPs are scale neutral so that tests can be on completely different scales, like the 2013-2014 ISTEP+ and the 2014-2015 College and Career Ready Assessment, and SGP analytics can still be performed without any impact upon the analyses.

States using this metric often summarize growth using the median or the mean instead of the percentage of students above a cut as done in option 1. However, the percentage of students above a cut is also popular and seen as more easy to understand.

Options 5: Improvement is not a student growth measure but instead looks at the change in the percentage of students deemed proficient in a group from 1 year to the next. This metric is a poor substitute for growth, particularly if the state intends to have an actual student growth metric in the future, and will be difficult to communicate the change in metrics as they occur. Also, because there is likely to be large drops in percentages of students deemed proficient statewide, "improvement" will likely not be the case as drops of 10, 20 or 30 percent might be the norm in the state leading to additional communication issues.

In considering which option is best given the current assessment transition, several considerations should be considered including: (i) ability to calculate, (ii) consistency (or lack thereof) with currently used methods, and (iii) communication challenges associated with use of the method:

(i) In terms of being able to calculate the relevant quantities, only option 2 (targeted growth) is unavailable. The presentation given June 16th indicates that the currently used "Year Projected" quantities can't be calculated. As mentioned above, they can't be calculated in exactly the same way done previously. However, very minor, and statistically reliable, modifications to the current procedure can be used to calculate "Year Projected" targets.

(ii) In terms of consistency, if the goal is to maintain the current approach, which benefits from the fact that one wouldn't have to "train" for another approach, then the "Year Projected" targets is the preferred method. If the goal is to "make a break" from the current approach, then options 3, 4, and 5 are available.

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(iii) In terms of communication challenges, each option has its benefits/detriments given Indiana's past, current, and possible future use of growth. In reality, options 1, 2, and 4 are all based upon the same analytic technique (SGP). The scale invariance of the technique makes it flexible in how it can be "rolled up" as the descriptive student growth percentile and/or "targets". This flexibility provides options for providing multiple measures for stakeholders, some which could be used for accountability and others provided to further inform stakeholders.

Categorical Status change will require resetting of "values" two times (initially in 2014-2015 and then again in 2015-2016) which will require two value setting processes which may undermine credibility. In addition, in setting "values" it is likely that positive points will have to be given to students dropping in their level of achievement. This may present communication challenges as well that were also discussed at the June 16th meeting. If, as is being proposed, targeted growth also becomes a part of the categorical status model, then that would present another change to the model down the road.

Student Growth Percentiles have been criticized with regard to "peer based growth" in the state and may offer communication challenges along those lines.

Option 5, improvement, is not a growth model and the state would face the communication challenge of using a non-growth procedure in year 1 and, presumably, then switching to something growth based for the following years. Improvement would also likely see considerable drops in percent proficient requiring the state to "endorse" such drops as OK in terms of accountability.

There is no perfect option for Indiana's current situation. In laying out the issues to be considered, the most onerous is that of communicating the decision to the field. The technical issues associated with the calculable options (1, 3, 4, and 5) are all easily surmountable. Given the miscues over the past two years, the communication issues likely won't be as easy.

Student growth percentiles give the greatest flexibility for the state going forward in customizing indicators that have been validated nationwide for a variety of purposes including district, school and teacher accountability. This direction allows the state to pursue its currently approved A-F accountability system while considering refinements to the process as the new assessment comes online in the 2014-2015 academic year.

References

Betebner, D. W. (2009). Norm- and criterion-referenced student growth. *Educational Measurement: Issues and Practice*, 28(4): 42-51.