


ILLINOIS STATE BOARD OF EDUCATION MEETING
January 25-26, 2012

TO: Illinois State Board of Education

FROM: Christopher A. Koch, Ed.D., State Superintendent of Education
Susan C. Morrison, Deputy Superintendent/Chief of Staff 

Agenda Topic: Value Table Growth Models

Materials: Illinois's Growth Model Approach Using the Value Table Method

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Purpose of Agenda Item

To provide the Board with an overview of three growth models that were considered for Illinois's adoption for school and district accountability, including additional information regarding the recommended growth model, Value Tables.

Relationship to/Implications for the State Board's Strategic Plan

This agenda item supports **GOAL 1:** Every student will demonstrate academic achievement and be prepared for success after high school.

Expected Outcome(s) of Agenda Item

The Board will be asked to approve a motion authorizing the adoption and use of Value Tables as Illinois's statewide growth model for school and district accountability.

Background Information

Illinois is committed to the recognition and reward of student achievement *and* growth over time.

Beginning in May 2010, the Illinois Growth Model Working Group (GMWG) was appointed with representatives from more than 10 Illinois organizations, as well as a variety of district superintendents, technical advisors, and other stakeholders, to identify a growth model or models for Illinois's school and district accountability system. Following extensive discussion and thoughtful consideration, a final report by the GMWG was submitted to the Illinois State Superintendent in April 2011, in which the GMWG recommended three growth models as viable and worthy of further study:

1. Student Growth Percentile Rankings
2. Value Added models
3. Value Table models

Subsequently, beginning in April 2011, the Illinois Technical Advisory Council (TAC) conducted empirical investigations of these three models using Illinois's state assessment data and the TAC's results were presented in September 2011. Both the GMWG and the TAC concluded that

there is no single “right” or “best” growth model to select, as each comes with positive attributes and limitations. It is with this caveat in mind that Illinois proceeded cautiously in selecting a statewide growth model to demonstrate student progress over time and hold schools and districts accountable for student growth.

In order to select a statewide growth model for school and district accountability, the following growth model objectives were taken into account by Illinois State Board of Education (ISBE) agency staff:

Illinois will select a growth model that:

- Is transparent and understandable by educators and the public,
- Provides educators and students with a goal to work toward, and
- Sets the same growth expectation for all students.

The three growth models selected for further study were evaluated using the criteria above. Of the three growth models, Value Table models most closely satisfy the objectives specified above, and for this reason, Value Tables are the recommended growth model for Illinois.

Value Tables are relatively easy to understand, easy to implement, valid and reliable, and informative for students, teachers, schools, and districts. In addition, while we are cognizant that Value Added methods provide a differentiated growth model system for subgroups, we believe that all students should be held to the same expectations for student achievement and growth. We remain confident that Value Tables, particularly when used as part of our proposed differentiated accountability system in Illinois’s Elementary and Secondary Education Act (ESEA) Waiver application, will serve as a meaningful and informative measure of student progress and growth over time.

Please see the attached report for a comparison between Value Tables and other growth models. Note that while the overall use of Value Tables is recommended for Illinois’s growth model, the precise methods and Value Table points assigned to growth require additional development and consideration (please see Next Steps, below, for more information).

Analysis and Implications for Policy, Budget, Legislative Action, and Communications

Policy Implications: Illinois’s adopted growth model will be used as part of a new accountability measure for schools and districts, as outlined in Illinois’s ESEA Waiver application. Note that Value Tables may or may not be used as part of performance evaluations for teachers and principals as permitted by applicable statutes and rules. In other words, growth model selection for the use in performance evaluations may be left to the discretion of schools and districts.

Budget Implications: Funds allocated to the Illinois Longitudinal Data System (ILDS) will be used to support the dissemination of growth data to schools, districts, and teachers. Funds requested for FY13 will be used to support the ongoing calculation of growth model data for school and district accountability.

Legislative Action: None at this time.

Communication: The Value Table growth model may be of significant interest to educators and the public. We have already discussed the Value Table growth model during stakeholder

meetings about Illinois's ESEA Waiver application and have received positive feedback. We have received additional support from our TAC and other stakeholders throughout Illinois.

Pros and Cons of Various Actions

Growth models, in general, are statistical techniques – they cannot provide underlying reasons for *why* a student, school, or district is making progress. All three growth models considered correlate highly; however, results will differ depending on the growth model selected. Growth models should also be implemented with caution for schools and districts with fewer than 100 students. Even so, growth models (and Value Tables) provide valuable information regarding a student's academic achievement, information which can be used to drive instruction, improve performance, and achieve accountability targets.

Superintendent's Recommendation

The State Superintendent recommends that the State Board of Education adopt the following motion:

The Illinois State Board of Education hereby authorizes the use of Value Tables as Illinois's growth model for student, school, and district accountability.

Further, the Board authorizes the State Superintendent to make such technical and non-substantive changes as the State Superintendent may deem necessary in response to suggestions regarding the weighting of point values, the specification of performance categories, and other technical aspects of Value Tables.

Next Steps

Upon Board authorization of the use of Value Tables for Illinois's growth model for school and district accountability, Agency staff will seek input from technical experts, stakeholders, and senior management regarding the precise weighting of point values, the specification of performance categories, and other technical aspects of Value Tables. We plan to convene these meetings in March and will seek Board approval when the technical aspects of the Value Table growth model have been determined.

Once the technical aspects of Value Tables have been approved, growth model data at the student, school, and district levels will be provided online for schools, districts, and the public in order to inform instruction. Agency staff will also use Value Tables and growth model data as one indicator for a broader school and district accountability system, as outlined in our ESEA Waiver application.

Illinois's Growth Model Approach Using the Value Table Method

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Overview

Illinois is committed to the recognition and reward of student achievement *and* growth over time. In an era when decisions have been based solely on student assessment scores, the *progress* and *growth* of a student received little attention. More recently, public interest in growth models has increased as these models provide valuable and meaningful information to educators, parents, students, and stakeholders about the ongoing progress and improvement of our students, schools, and statewide education system. In addition, the use of growth models for student, school, and district accountability has increased nationwide. The purpose of this report was to evaluate and select a growth model for Illinois's school and district accountability system.

Beginning in May 2010, the Illinois Growth Model Working Group (GMWG) was appointed with representatives from more than 10 Illinois organizations, as well as a variety of district superintendents, technical advisors, and other stakeholders, to identify a growth model or models for Illinois's school and district accountability system¹. Following extensive discussion and thoughtful consideration, a final report by the GMWG was submitted to the Illinois State Superintendent on April 14, 2011², in which the GMWG recommended three growth models as viable and worthy of further study:

1. Student Growth Percentile Rankings
2. Value Added Models
3. Value Table Models

Subsequently, beginning in April 2011, the Illinois Technical Advisory Council (TAC) conducted empirical investigations of these three models using Illinois's state

¹ See http://www.isbe.net/GMWG/pdf/GMWG_members.pdf for a list of members of the Illinois Growth Model Working Group.

² See http://www.isbe.net/GMWG/pdf/gmwg_final_report_0411.pdf for the final report by the Illinois Growth Model Working Group.

assessment data and the TAC's results were presented in September 2011. In general, the following overarching themes emerged from the TAC's reports:

- All three models correlate highly with each other
- Reliability for all three models is drastically reduced for schools and districts with fewer than 100 students
- Use caution when applying growth models at the classroom level

Perhaps most importantly, both the GMWG and the TAC concluded that there is no single "right" or "best" growth model to select. It is with this caveat in mind that Illinois proceeded cautiously in selecting a statewide growth model to demonstrate student progress over time and hold schools and districts accountable for student growth.

Growth Model Objectives for Selection

In order to select a statewide growth model for school and district accountability, the following growth model objectives were taken into account by Illinois State Board of Education (ISBE) agency staff:

Illinois will select a growth model that:

- Is transparent and understandable by educators and the public,
- Provides educators and students with a goal to work toward, and
- Sets the same growth expectation for all students.

The three growth models selected for further study were evaluated using the criteria above³. Table 1 shows the overarching method for each growth model, along with pros and cons for each method.

³ Please note that the growth models evaluated in this report were considered solely for the purpose of school and district accountability. These growth models may or may not be used as part of performance evaluations for teachers and principals as permitted by applicable statutes and rules. In other words, growth model selection for the use in performance evaluations may be left to the discretion of schools and districts.

Table 1: Methods, pros, and cons for the three growth models selected by the Illinois Growth Model Working Group for further study

Growth Models	Methods	Pros	Cons
Student Growth Percentile Rankings	Rank how well students grow relative to other students starting at the same place.	Easy to understand and explain to stakeholders. Compares students to “academic peers.”	There will always be students in the bottom 50% and in the top 50%. Because the rankings are relative, it is impossible for everyone to achieve high growth. “Academic peers” may be similarly ranked, but for various reasons. Does not provide a specific goal to work toward.
Value Added Models	Predict/project student growth as “on track” while controlling for and partialling out non-school factors (e.g., income status, race/ethnicity, etc.).	Able to isolate the impact of school factors on student achievement. Most rigorous statistical model for predicting teacher and school impact.	Difficult to understand regression models. Informs stakeholders whether a student is “on track” but does not provide a specific goal to work toward. Sets different expectations for subgroups.
Value Table Models	Assign points based on student growth between previous and current years.	Somewhat easy to understand and explain to stakeholders. Provides a specific goal to work toward. Sets the same expectation for all students.	The assignment of points to progress levels is subjective – there is no industry standard.

Recommended Growth Model: Value Tables

As shown in Table 1, each of the three models includes positive attributes and limitations. Of the three models, Value Table models most closely satisfy the growth model objectives specified above – Value Tables are understandable, provide a goal, and set the same expectation for all students. For these reasons, Value Tables are the recommended growth model for Illinois. At the same time, we remain mindful that there is no one “best” growth model to select, evidenced by the fact that a variety of growth models are currently in use across the United States. In particular, the intended *use* of growth models should be carefully considered when making selection decisions, as some models may be more appropriate for measuring student progress whereas other models may be more appropriate for measuring teacher impact at the classroom level. For the purpose of school and district accountability, and also for the purpose of informing instruction, we feel that a Value Table model is the most appropriate growth model at this time.

While we are cognizant that a Value Added model provides a differentiated growth model system for subgroups, Value Added models do so by setting different expectations depending on subgroup status. In contrast, we believe that all students should be held to the same expectations for student achievement and growth. As such, we remain confident that Value Tables, especially when used as part of our proposed differentiated accountability system in Illinois’s Elementary and Secondary Education Act (ESEA) Waiver application, will serve as a meaningful and informative measure of student progress and growth over time, while still holding all students to the same expectations. For example, as part of our ESEA Waiver application, schools and districts will be held accountable for improvements in subgroup performance and growth, and they will also be held accountable for reducing achievement gaps (e.g., for historically low performing minorities, English Language Learners, students with disabilities, low income students, etc.). In essence, we propose using growth and the Value Table model as part of a broader, differentiated accountability system for all students and subgroups.

The remainder of this report provides the reader with additional information regarding Value Tables. Please note, however, that the precise weighting of point values, the specification of performance categories, and other technical aspects of Value Tables requires careful consideration and development. As noted in Table 1, there is no industry standard at this time for setting Value Table point determinations

and performance categories. As such, Illinois will seek input in the coming weeks from technical experts, stakeholders, and others to inform the development and implementation of Value Tables in our school and district accountability system.

Value Table Methods: Preliminary Recommendations & Next Steps

Illinois prefers a Value Table approach because it relies on familiar concepts like score categories, and the computation of students' "Value Points" based on these tables involves little more than simple lookups and weighted student counts. Despite the simplicity of the Value Table approach, recent work by our psychometric experts on our TAC indicates high agreement among the outcomes of the Value Table method and those of more complex methods (e.g., Value Added methods) that rely on the use of hierarchical linear modeling and quantile regression. Furthermore, while Value Tables may remain the "lesser known" of the three models recommended by the GMWG, Value Tables have been successfully implemented in other states, including Delaware, Iowa, Michigan, and Minnesota.

Illinois recommends the implementation of Value Tables using a two-year growth approach. This two-year approach is designed to,

- Include as many students in the growth calculation as possible, and
- Ease planning and understanding for teachers, administrators, and parents over time.

These goals are best obtained when no more than two consecutive years of data are needed.

To begin the development of a Value Table model, we need to determine the number of progress categories within the Value Table. A total number of six performance categories is recommended based on preliminary analyses using Illinois statewide assessment data, as six categories provided enough specification to demonstrate growth without such specificity as to minimize the importance of growth. Different numbers of categories are used in other states, but we have found that most of the states using Value Tables employ five to seven categories. Upon stakeholder input, however, the number of performance categories may change.

Second, we need to set score ranges for each of the performance categories. Once set, these score ranges should remain consistent; in other words, the Value Table performance category score ranges are *not* to be recomputed yearly.

Third, we need to assign “value points” for progress that students obtain between the performance categories in two adjacent years. In general, student progress from lower categories into higher categories reflects improvement (above the gray diagonal in Tables 2 and 3 below), whereas movement from higher categories into lower categories reflects a decrease in progress (below the gray diagonal in Tables 2 and 3). Again, the precise determination of value points requires careful consideration, including point values on the diagonal, above the diagonal, and below the diagonal.

As examples, Table 2 includes a Value Table with equal value points such that all growth is weighted equally regardless of where students “start” in Year 1. In contrast, Table 3 includes a Value Table with *weighted* value points such that growth is more heavily weighted for students who were originally low-achieving in Year 1 but demonstrate growth in Year 2.

Table 2: An example of an *equally-weighted Value Table* showing students’ value points as a function of their performance categories achieved in the previous year (displayed in rows) vs. the current year (displayed in columns)

		Student Performance in Year 2 (Current Year)					
		1	2	3	4	5	6
Student Performance in Year 1 (Previous Year)	1	50	60	70	80	90	100
	2	40	50	60	70	80	90
	3	30	40	50	60	70	80
	4	20	30	40	50	60	70
	5	10	20	30	40	50	60
	6	0	10	20	30	40	50

Table 3: An example of a *weighted* Value Table showing students' value points as a function of their performance categories achieved in the previous year (displayed in rows) vs. the current year (displayed in columns)⁴

		Student Performance in Year 2 (Current Year)					
		1	2	3	4	5	6
Student Performance in Year 1 (Previous Year)	1	50	100	140	170	190	200
	2	40	60	100	130	150	160
	3	30	50	70	100	120	130
	4	20	40	60	80	100	110
	5	10	30	50	70	90	100
	6	0	20	40	60	80	100

Note that students' growth and progress, defined in terms of average value points, can be computed separately for ESEA subgroups (e.g., race/ethnicity, English Language Learners, students with disabilities, low income students, etc.). In addition, value point averages can be computed for schools and districts, and value point indices can be combined with other variables to create a differentiated school and district accountability system.

Finally, in the development of a Value Table model, Illinois will need to develop policy guidelines for missing data and small schools. Any growth model relying on longitudinal data across grades will always be plagued with missing data as students transfer, drop out, leave the state, and so on. In addition, the reliability of any growth model decreases as the number of students included in the model decreases. Based on preliminary analyses, extra caution should be used for schools and districts with fewer than 100 students.

⁴ We thank David Figlio, Orrington Lunt Professor of Education and Social Policy at Northwestern University, for his help in the weighted Value Table point example.

Conclusion

The purpose of this report was to provide insight into Illinois's selection process and ultimate preference for Value Tables. Based on extensive discussion with the Illinois TAC, GMWG, and other stakeholders, we found the following:

- A Value Table model provides educators and the public with an understandable goal for student progress
- A Value Table model provides all students with the same progress goals to work toward
- A Value Table model can be used in a broader system of differentiated accountability for schools and districts
- A Value Table model is highly correlated with the other two models considered (Value Added and Student Growth Percentile Ranking models)

Further, we recommend the following:

- A Value Table model should include a two-year growth approach, which includes as many students as possible and eases understanding of the growth calculation
- A Value Table model should include approximately six performance categories
- A Value Table model requires careful consideration in setting scale score ranges for the performance categories and point values on, above, and below the diagonal
- A Value Table model should include guidelines regarding missing data and use for schools and districts with fewer than 100 students

Upon adoption of a Value Table model for Illinois's differentiated accountability system for schools and districts, we expect that the Value Table growth model will provide valuable and meaningful information to educators, parents, students, and stakeholders about the ongoing progress and improvement of our students, schools, and statewide education system.

Upon Board authorization of the use of Value Tables for Illinois's growth model for school and district accountability, Agency staff will seek input from technical experts, stakeholders, and senior management regarding the precise weighting of point values, the specification of performance categories, and other technical aspects of Value Tables. We plan to convene these meetings in March and

will seek Board approval when the technical aspects of the Value Table growth model have been determined.

Once the technical aspects of Value Tables have been approved, growth model data at the student, school, and district levels will be provided online for schools, districts, and the public in order to inform instruction. Agency staff will also use Value Tables and growth model data as one indicator for a broader school and district accountability system, as outlined in our ESEA Waiver application.