

Accelerate Student Achievement for All by Increasing Student Self- Assessment and Expectations



Adisack Nhouyvanisvong, Ph.D.

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Naiku is a next generation assessment platform, providing teachers with comprehensive assessment tools to help teachers collect data about their students to make informed instruction.

7620 W 78th Street
Edina, MN 55439
Phone: 612-346-2458
E-Mail: info@naiku.net
Web: www.naiku.net

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Introduction

In a synthesis of over 900 meta-analyses, Hattie (2009, 2012) found that **student expectations** had the greatest effect on student achievement over all other factors and instructional strategies. The effect size was a whopping $d = 1.44$. Note that an effect size $d = 1.00$ indicates an increase of one standard deviation and is typically considered a huge effect, analogous to advancing student achievement by two to three years.

So what is “**student expectations**” and how can teachers harness its benefits for their students? In this paper, I summarize what Hattie means by student expectations, its relation to student mastery goals, and its interaction with student confidence. I then present practical ways to put these concepts and strategies into practice.

Student Expectations

Teachers know that student expectations play an important role in student learning. It is important for students to set appropriately high and challenging goals. And it is the task of teachers to help all students meet or exceed those expectations.

How can teachers know what expectations students have set for themselves? How can teachers know if those expectations have been set high enough? Hattie (2012) suggests that to know the students’ expectations, teachers should ask students to self-report their grades. In fact, Hattie originally called this strategy “self-reported grades.” Hattie suggests that to self-report their grades, students should predict their scores on an assessment before they attempt the assessment. When students set high expectations and correctly predict their scores (i.e., self-report their grade), they had the greatest learning outcomes. Self-reported grades is what Hattie now calls student expectations. In fact, he wished he had originally called this factor “student expectations” as opposed to “self-reported grades” to make more transparent and clear that the strategy involves teachers finding out what the student expectations are and helping students exceed those expectations.

So, student expectations (or self-reported grades) had the highest effect size among the 150 influencers of

student achievement investigated by Hattie. That is, when students accurately predicted their level of achievement, they tended to actually show greater levels achievement. In other words, when students set high expectations and accurately estimate their performance relative to those expectations, students were more likely to achieve or attain those learning goals.

It would seem simple enough that to increase student learning, teachers should just ask students to predict their scores on a test before taking it.

Hold on. As with many things in education, it is not that simple. Not all students are good at correctly predicting their performance. This is especially true for minority and lower-achieving students.

Minority students and lower-achieving students are less accurate with their prediction of their achievement. In fact, they tend to underestimate their achievement. This has the dire consequence that over time, they can come to believe their lower estimates and lose confidence to take on challenging tasks (Hattie, 2012).

Changing this has proven to be difficult. Often these students come into the classroom with years of lower expectations and lower confidence. They have low self-estimates and self-understanding. This does not mean that it cannot be changed or that teachers should not try to change these students’ expectations. All teachers must believe that all students have the capacity to learn and to grow.

Student Mastery Goals

One way to change student expectations and self-understanding is to get students to develop and enhance their metacognitive skills. Metacognition is often defined as “thinking about thinking”. It is a higher-order thinking skill that involves active control of the cognitive processes engaged in learning. Hattie (2012) also found that metacognitive strategies have a significant impact on student learning.

Better metacognitive skills can be learned. Students can be taught how to better manage their learning activities by practicing metacognitive strategies to evaluate their learning outcomes. For example, Livingston (1997)

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showed that through Cognitive Strategy Instructions (CSI), students can become more strategic, self-reliant, flexible, and productive in their learning. The assumption with CSI is that most students can learn these strategies.

In a classroom setting, De Carvalho Filho (2009) found that high metacognitive students had personally adopted more deep-processing strategies as well as performed more individual and review activities. This led to better understanding of the material from the test-taking experience. The exciting implication is that in addition to learning from classroom instruction and test preparation, students had used metacognitive tools during testing and were able to leverage those strategies as part of their learning experience.

A good technique to develop student metacognition and expectations is to get them to develop mastery goals. Ask students to think about the learning goals or targets and ask them to internalize them so that they fully understand them. Then ask them to reflect on these learning targets. What do they currently know about them? What can they do now to demonstrate their knowledge and understanding of these targets? Where do they think they can go? Do they think they can further develop their competence or mastery of these targets? Then ask students to formalize and write down their mastery goals for these learning targets.

When students set mastery goals, they set expectations that push them to strive to learn the new skills. This forces them to view these skills as something that they can further develop by increasing effort (Hattie, 2012). This changes the student perspective from one where they may have viewed their ability as stagnate and invariable to one where they view it as changeable with effort. Thus, this reinforces to the student that they can indeed learn and grow.

Student Confidence

Another way for teachers to gain insight into student expectations is to ask students to develop their confidence. When students provide confidence ratings as they solve problems (e.g., solving a test question), they are in fact utilizing and developing their metacognitive skills. The confidence ratings of students are in essence their prediction of how well they think

they will do. It provides insights into the expectations that they have set for themselves.

Contrary to self-reported grades, which are predictions on the overall test, confidence ratings allow students to make predictions on their performance on each individual test question. This practice of giving confidence ratings on each question gives students more practice at developing and enhancing their metacognitive skill, which increases their overall learning.

Desoete (2009) for example asked Grade 3 students to make metacognitive predictions (i.e., confidence ratings) as they took several math assessments. Students used a four-point rating scale of 1 (Absolutely sure I am wrong), 2 (Sure I am wrong), 3 (Sure I am correct), and 4 (Absolutely sure I am correct). Doeste found that students who were trained to give the confidence ratings gained higher metacognitive and evaluation skills after the training. Moreover, these same students also gained higher arithmetic reasoning skills than students in the control group who were not trained to provide confidence predictions.

Chen, Ho, & Yen (2010) found that Grade 9 students who marked their answers (i.e., flagged their answer for later review because they were unsure of their answer) during test-taking and were given metacognitively-evaluated feedback performed better on a vocabulary and reading comprehension test. Medium ability students showed the greatest benefit from this activity, which is encouraging since that group was targeted to have the most potential for improvement.

Gaining insight into student confidence allows teachers to gain deeper insight into student expectations. As Hattie found, when teachers understand what expectations students have set for themselves and when teachers help those students strive to reach or exceed those expectations, students show large learning gains. Though teaching students to set high expectations and correctly self-predict their performance may be hard for minority and lower-achieving students, it is well worth the effort to try to teach students this metacognitive skill. As Livingston (1997), Desoete (2009), and Chen, Ho, & Yen (2010) have shown, students can be trained to develop their metacognitive skills, which has the positive effect of

also developing their learning and understanding of the concepts and skills.

Putting It Into Practice

To reap the benefits of what Hattie calls student expectations, a teacher can simply ask students to predict their score before taking the exam. When students engage in self-assessment (predicting their own scores) teachers gain insight to the students' expectations, which enables teachers to guide students to meet or exceed those expectations.

However, as Hattie stated, some students are not particularly adept at making accurate predictions of their performance. They may have not set appropriate expectations. Or they may have come to the class with a long history of under performance and low expectations, which make them less likely to set high and challenging expectations and less likely to accurately predict and reach the goals that teachers would want to set for all students. So, maybe it is not that simple after all.

It may not be a simple one-step solution of just predicting a test score, but I advocate a four-step process that teachers can put into practice to help students increase learning and achievement. The four steps in the process are:

1. Goal Setting
2. Test Score Prediction
3. Confidence Prediction
4. Test and Item Reflection

With a next generation assessment platform like Naiku, students can partake in all four activities directly during the assessment process. These processes help transform testing into learning. Below, I share how each of these four steps are implemented in Naiku.

Goal Setting

In Naiku, goal setting is done at the class level. For each class, students are encouraged to write weekly or bi-weekly goals pertaining to the learning targets that will be covered during the week or the next two weeks. These goals, when written out, help them internalize and understand the learning targets. They also help students set performance expectations so that they can

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strive to meet or exceed them. When practiced regularly, goal setting becomes a journaling opportunity for students to reflect on what it is that they are to learn, where they are currently in relation to those goals, and where they need to go to achieve those goals.

Assessment	Open Until	Time limit	Actions
Pythagorean Theorem Quiz Take test			
Assessment	Score	Items correct	Date
Math Quiz 2	2 of 5	2 of 5	2013-02-05
Math Quiz 1	4 of 5	4 of 5	2013-02-04
Math Test 1	4 of 5	4 of 5	2013-11-07
Math Quiz 3	2 of 5	2 of 5	2013-08-20
Right Triangle Quiz	2 of 4	2 of 4	2014-10-11

Math Per 3

Curriculum Map
Naiku Math Team Curriculum Map

Teachers
Abe Lincoln

Your Goals
My goal this week is to understand the pythagorean theorem such that I can calculate the sides or the hypotenuse and score better than 85% on all quizzes and tests.
February 10, 2015 16:21

Add journal entry

Save entry

Figure 1. Student Goal-Setting in Naiku.

Teachers and students should review these goals and compare them to actual student performance. Feedback from teachers to students, and from student to teachers is crucial in the review of performance against the goals. When students do not reach their goals, teachers must provide descriptive guidance on what they need to do next in order to reach those goals. Students must provide feedback to teachers on what and how the teacher can help them reach their goals.

Test Score Prediction

After students have set their mastery goals, for each exam that they take, ask them to predict their performance before they start to answer the questions. Again this is what Hattie (2012) calls self-reported grades. In Naiku, students make this prediction when they read the instructions for the test. They are instructed to move a slider between 0 and 100 to indicate how they think they will do on the exam.

INSTRUCTIONS

This is a short quiz on what we learned this week about algebraic equations. Please take your time on each question. We will discuss the results in class immediately after everyone finishes the quiz.

Note: You can always click on the next to the exam title to show these instructions again.

On a scale of 0 to 100, predict how well you will do on this test: **85%**

Figure 2. Test Score Prediction in Naiku.

At the end of the test when students receive their actual test result, they are presented their predicted score alongside. Comparing the predicted score to the test score allows students to reflect on and reconcile any discrepancies between their expected and actual scores. This information not only gives students insight into whether they are meeting their goals on the specific assessment, it also provides them opportunities to continually monitor their progress towards their overall mastery goals.

Confidence Predictions

On top of providing a prediction on the overall test, in Naiku students are encouraged to predict their confidence on each question. Student confidence predictions are collected on a 3-point scale ranging from Low, Uncertain, and High.

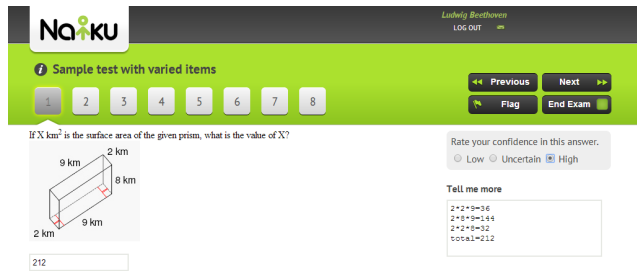


Figure 3. Confidence Prediction in Naiku.

When students predict their confidence on the answer to each question, they get multiple opportunities to develop their metacognitive skills. The extra practice is essential to developing the students' thinking about their thinking. At the conclusion of the test, it is integral to provide metacognitive feedback to the students. They should be shown their confidence prediction and their actual performance on the question (i.e., whether they got it correct or incorrect). With this information, students can further engage in more metacognitive thinking and reflect on their performance. For example, if they rate their confidence as low but answer the question correctly, this provides more opportunities for them to reflect on the difference. The more they reflect on the discrepancy, the better understanding they will have and the better they will be at calibrating their prediction ability (i.e., they are developing their metacognitive skills).

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Test and Item Reflections

The last step of the process is for students to provide detailed reflections on their overall test performance and their performance on each question. On the overall test reflection, encourage students to describe what they did well, and for the areas that they didn't do well, ask them to describe activities that they will do to close that gap between where they are and where they want to be (their mastery goal).

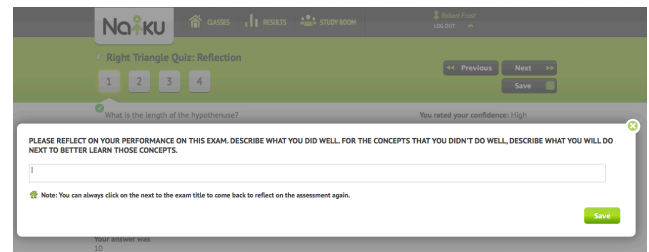


Figure 4. Test Reflection in Naiku.

After reflecting on the overall performance, also encourage students to reflect on their performance on each question. They should reconcile their confidence prediction with their performance on each item. In Naiku, students are provided with "reflection tags" to select from, ranging from "I know and Understand" to "I'm having a difficult time."

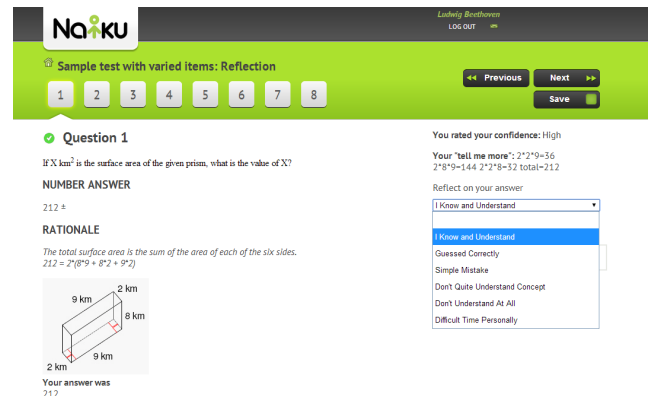


Figure 5. Item Reflection in Naiku.

When practiced as 4-step process, starting with setting mastery goals and ending with item reflection, students are afforded multiple valuable learning opportunities to accurately set high and challenging expectations. The more opportunities that students have to reflect and think metacognitively, the better they become at it. When they properly develop this higher-order thinking skill, students are more apt to set, accurately predict,

and exceed their own expectations. And this above all, was the factor that most greatly impacted student achievement.

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<http://gse.buffalo.edu/fas/shuell/cep564/metacog.htm>.

About the Author

Dr. Nhouyvanisvong received his Ph.D. in Cognitive Psychology from Carnegie Mellon and has spent his career in the design of educational assessments. He has taught graduate courses on assessment practice and theory. He is the author, co-author, and/or presenter of numerous papers and presentations on the subject of educational assessment and has ensured the psychometric integrity and soundness of various assessments while at the Minnesota State Department of Education, Data Recognition, and Pearson.