Examples of Effective Formative Assessment

Craig C. Winkler

Literature Review

Submitted in Partial Fulfillment of the

Requirements for the

Master of Science Degree in Education

Graduate Studies

Martin Luther College

New Ulm, MN

May 2010

Signature Page

Date: May 15, 2010

This literature review has been examined and approved.

Examining Committee:

_____
Gene Pfeifer, Ph.D Chair

_____
Carla Melendy, Ph.D

_____
LeDell Plath, Ed.D.

Graduate Studies

Martin Luther College

New Ulm, MN

Author:	Winkler, Craig C.
Title:	Examples of Effective Formative Assessment
Graduate Degree:	MS Education
Advisor:	Dr. Gene Pfeifer
Month/Year:	May 2010
Number of Pages:	
Credits:	3

Outline of the Paper

Examples of Effective Formative Assessment

Introduction

Overview of the Topic

The researcher's recent coursework has helped him better understand the use of summative and formative assessments in his classroom. While grading focuses on the summative aspect of assessments, his coursework has led him to realize the importance of formative assessment. In his own classroom, the researcher has successfully experimented with a few of the examples of formative assessment. However, formative assessment includes a wide variety of student and teacher interactions and behaviors. As the researcher strives to improve his own teaching, help students learn, and provide leadership for his staff, he wants to know which types of formative assessment are most effective. Through his project, the researcher intends to identify several examples of effective formative assessment. It is anticipated that the findings will be useful in the classrooms of the researcher and his colleagues and be beneficial for his students.

Introduction to the Paper

The dual purpose of this paper is to 1) identify examples of formative assessment found in the literature review and 2) share the examples of formative assessment through discussion. In this introduction, the researcher will share an overview of the whole paper, explain the significance of the literature review, and define formative assessment.

The first major part of this paper will be the literature review. In the subsections of the literature review, the researcher will share literature that supports the need for formative assessment and provides examples of formative assessment. In the final part of this section, the

researcher will identify and discuss several examples of formative assessment that have been shown in research to be effective in promoting student learning.

In the second major part of this paper, the researcher will discuss the examples of effective formative assessment, share examples that are important to his ministry, and share how they could be applied to his students, his colleagues, and teacher training institutions.

Definition of Terms

Black and Wiliam (1998) acknowledged that there is not an internationally agreed-upon term for formative assessment. “Classroom assessment, classroom evaluation, internal assessment, instructional assessment, and student assessment have been used by different authors, and some of these terms have different meanings in different texts” (p. 148).

The two main types of assessments are summative and formative. Stiggins, Arter, Chappuis, J., & Chappuis, S. (2007) described summative assessments, or assessments *of* learning, as “Those assessments that happen after learning is supposed to have occurred to determine if it did” (p. 31). They described assessments for learning as the following:

> Assessments that we conduct throughout teaching and learning to diagnose student needs, plan our next steps in instruction, provide students with feedback they can use to improve the quality of their work, and help students see and feel in control of their journey to success. (p. 31)

Brookhart, Moss, and Long (2008) explained effective formative assessment, or assessments for learning, this way, “The power of formative assessment comes from the addition of student-to-teacher communication. Each student shows the teacher all along the way where his or her understanding is deep, shallow, or stalled” (p. 52). Black and Wiliam (1998)

added, “Such assessment becomes *formative assessment* when the evidence is actually used to adapt the teaching to meet student needs” (p. 140). Tomlinson (2008) preferred to use the term informative assessment when describing the teacher and student interaction. Kuske (1987) described the teaching/learning process as “Applications which test (so we can fill in gaps left in the understanding) and review (recall and use knowledge)” (p. 4). Popham (2008) included planning for it as he wrote, “Formative assessment is a planned process in which assessment-elicited evidence of students’ status is used by teachers to adjust their ongoing instructional procedures or by students to adjust their current learning tactics” (p. 6).

Therefore, the researcher defines formative assessment as evaluative tools that assess where students are in their learning, strategies used to help students learn, and adaptations in teaching to improve their achievement.

The Significance of the Literature Review

The researcher is seeking to learn examples of effective formative assessment as revealed in the literature. Teachers realize that children do not learn just by hearing information. Children need to understand and mentally process the information, but they do not learn at the same rate or in the same way. Teachers’ practice, or what they do in the classroom to promote learning, is scrutinized when students are below average, struggling to learn, and/or are not making much academic progress. As noted above, formative assessment describes any activities that teachers and students do to close the learning gap of where the students are and where they should be or want to be. Many teachers, like the researcher, want to know the most effective examples of formative assessment, so they can help students succeed. The results of the literature review will illustrate these important examples of effective formative assessment.

The researcher will choose the examples that might be used effectively in his classroom setting. His colleagues and other teachers could consider implementing the formative assessment examples in their classrooms to improve learning.

Literature Review

Introduction

This section of the paper has two main parts. The first part will explain the need for effective formative assessment to improve student learning. In the second part, the researcher will share his review of articles related to the examples of effective formative assessment. The articles which discuss the same examples of formative assessment will be grouped together. As mentioned above, assessment for learning assesses where students are in their learning, and how teaching is adapted to meet their needs to improve their achievement. The literature includes the following examples of formative assessment: teacher training/professional development, learning goals, quality teacher and student interactions, multiple assessments tied to tailored instruction, flexible schedules, equal access to learning to all students, mastery learning, corrective feedback, students' learning processes, assessments, teacher expectations, student self-assessment, motivation, cumulative practice, tiered feedback, feedback plus solution sequence instruction, review practice, transfer training, and peer assessment. This list is in the order they will be presented. The examples are grouped according to the articles where there are topical similarities.

The Need for Effective Formative Assessment

Recently, teachers have become more and more responsible for and accountable for student learning. The pressure is real. Stiggins (1999) delineated this evolution of testing:

> In the 1950s and 1960s, we added commercially developed, norm-referenced, district-wide standardized testing programs in an effort to achieve local accountability. Ever since, superintendents and others in positions of authority have threatened drastic action if scores do not continually improve.
>
> The 1970s became the decade of the statewide testing program. We began the decade with three statewide assessments and ended it with nearly 40. Today, virtually every state has one. Legislatures promise their constituents that scores will go up or heads will roll – a thinly veiled threat to spur educators to work harder.
>
> In the 1970s and 1980s, we implemented a national assessment program. In the 1980s and 1990s, we have discovered the political power of international assessments. Recent reports of math and science results in the media have led to worries that we had better raise our standing among the nations of the world or risk social and economic decay. (p. 192)

The federally mandated No Child Left Behind 2001 (Public Law 107-110), which was based on the belief that setting high standards and establishing measurable goals can improve individual outcomes in education, has heightened public and private teachers' attention on student achievement. Last year, the Obama Administration established a $4.35 billion fund that Education Secretary Arne Duncan could distribute to states on the basis of their willingness to reform their schools. Klein (2010) wrote, "Duncan's definition of reform – a common one these days – demanded more school choice and competition as well as an emphasis on teacher evaluation and accountability" (p. 20). Unfortunately, the pressure on educators and

policymakers to demonstrate accountability in schools has driven some to use the test results inappropriately (Holloway, 2001). Stiggins (1999) stated the following concern:

> I submit that teachers trapped in these circumstances are likely to respond in one or all of the following ways. The teachers will either sharply increase their levels of nervousness, yet unfocused, activity as they try (in a state of fear and against all odds) to guess what course of instructional action might lead to higher test scores; become intensely defensive and then highly frustrated, leading them to conclude that it is in their best interests to oppose all "school improvement" efforts; or leave the profession because of profound lack of support that they feel. Obviously, these are not actions that are likely to lead to enhanced student achievement. (p. 192)

Heritage (2007) also commented on teacher frustration when she wrote, "Educators recognize that annual state tests provide too little information that arrives too late for planning instruction" (p. 140). Black and Wiliam (1998) concluded, "But the sum of all these reforms has not added up to an effective policy because something is missing" (p. 140).

State tests are examples of summative assessments. What is missing is more focus on the learning process to help children improve their achievement. Black and Wiliam (1998) offered a solution based on their meta-analyses, "Our own review has selected at least 20 more studies. All these studies show that innovations that include strengthening the practice of formative assessment produce significant and often substantial learning gains" (p. 140). Similarly, Moss (personal communication, March 18, 2009) wrote, "Formative assessment is the way to impact both teacher quality and student achievement. I have never seen another initiative have so strong of an impact on both." Pedersen, Arslanyilmaz, and Williams (2007) agreed that teachers

use formative assessment to modify classroom activities based on students' needs. Black and Wiliam (1998) added the following:

> Learning is driven by what teachers and pupils do in the classrooms. Teachers have to manage complicated and demanding situations, channeling the personal, emotional, and social pressures of a group of 30 or more youngsters in order to help them learn immediately and become better learners in the future. (p. 140)

Stiggins (1999) agreed, "But such testing by itself cannot produce the desired school improvement, because the tests do not deal directly with matters of teacher effectiveness or student motivation" (p. 192). Educators have been searching for methods of group instruction as effective as one-to-one tutoring (Bloom, 1984). Heritage (2007) added, "Formative assessment, if used effectively, can provide teachers and their students with the information they need to move learning forward" (p. 140). Black and Wiliam (1998) reviewed over 160 journals covering nine years of research to answer three important questions. They wrote the following:

> Is there evidence that improving formative assessment raises standards? Is there evidence that there is room for improvement? Is there evidence about how to improve formative assessment? . . . The conclusion we have reached from our research review is that the answer to each of the three questions above is clearly yes. (p. 140)

These experts agreed that formative assessment improves student achievement. Formative assessment provides strategies for teachers to help students move learning forward and succeed on summative assessments.

Examples of Effective Formative Assessment

What does formative assessment look like? The researcher has compiled the following articles which show formative assessment in action. These articles describe useful examples of effective formative assessment.

Teacher training/professional development, learning goals, quality teacher and student interactions, multiple assessments tied to tailored instruction, flexible schedules, and equal access to learning for all students. In the legislation related to No Child Left Behind, school districts like Milwaukee Public Schools (MPS) and some individual schools are struggling to keep their doors open because their students repeatedly did not achieve the required yearly academic progress. In Richards' *Milwaukee Journal Sentinel* article, teacher training is highlighted as an important example of formative assessment. The Milwaukee Public Schools District is notorious for its problems. Recently, the Department of Public Instruction Superintendent Tony Evers announced that he may withhold $175 million from MPS because it has failed to fulfill multiple elements of its state-ordered educational plan. Evers (2010) wrote the following:

> The district has repeatedly advised my staff and me, orally and in writing, that the district is unwilling to complete several key areas of corrective action, which are essential to ensuring that quality instruction is systematically delivered to all students in MPS. (p. 5)

MPS has successfully conducted a needs assessment for principals in poor-performing schools and showed a professional development plan for them, demonstrated it could analyze student achievement, attendance, and behavior through a data warehouse, and showed that it could implement a system to recruit students in the neediest schools into tutoring services. According

to the state (WI) Department of Public Instruction, Richards (2010) noted the following problem areas for MPS:

> 1) not developing a citywide attendance, dropout-prevention and recovery plan, 2) not providing an electronic list of newly hired first-year educators, their mentors and schools, or a list of newly hired teachers on emergency licenses or permits, their school assignments and induction support, 3) not providing a teacher-by-teacher and school-by-school list of professional development in key areas, and 4) not implementing a procedure schools could use three times a year to determine the names and numbers of students at risk and in need of intervention services. (p. 5)

In many large cities, school reform has been a hot topic. Rourke (2006) shared the following cornerstone strategies for school reform:

1. Establish the academically rigorous essential learning goals that a student is required to master in order to successfully make the transition to high school and align the curriculum and teaching strategies to realize that goal.
2. Create dynamic teacher teams that are afforded common planning time to help organize and improve the quality and quantity of interactions between teachers and students.
3. Ensure that teachers assess the individual learning needs and tailor instructional strategies and multiple assessments accordingly.
4. Entrust teachers with the responsibility of implementing flexible schedules to accommodate teaching strategies consistent with the ways students learn most

effectively and that allow for effective teacher teaming, common planning time, and other lesson planning.

5. Align all programs and structures so that all social, economic, and racial/ethnic groups have open and equal access to learning and challenging activities.
6. Align the school-wide comprehensive, ongoing professional development program and the Personal Learning Plans of staff members with the requisite knowledge of content, instructional strategies, and student developmental factors. (p. 8)

If these cornerstone strategies are implemented properly, Rourke believed that they will improve the performance of each child in every school. He noted that the professional development is the foundation of this reform. Professional development would help the teacher acquire the skills needed to complete the other strategies. When teachers have flexible schedules to improve the quality of interactions with students, they can assess students' learning according to the learning goals. The teachers can use the assessment information to identify individual learning needs and tailor instruction appropriately. When these examples of formative assessment are implemented, children will be successful in the classroom.

In a study designed by Yin, Shavelson, Ayala, Ruiz-Primo, Brandon, Furtak, Tomita, & Young (2008), teachers were given a curriculum with formative assessment embedded. The analyses of the students' test scores showed that embedded formative assessment did not have a significant influence. The authors pointed out that some of the teachers in the experimental group did not use embedded formative assessment as designed because the training was inadequate. This supports the work of Rourke (2006).

Mastery learning, corrective feedback, and students' learning processes. Bloom (1984) cited the works of Anania and Burke, two University of Chicago doctoral students. They had done separate research projects comparing student learning under conventional teaching, mastery learning, and tutoring situations. In the conventional group, or the control group, the thirty students were given tests for the sole purpose of earning grades. In the mastery learning group, thirty students were given formative tests to provide the opportunity to use feedback with corrective procedures. The students would take additional formative tests to determine the level of mastery. The tutoring group used the same formative tests and procedures as the mastery learning group, but this group had no more than three students per tutor. The separate studies involved different subjects and different grades of children. However, their results were very similar. The average tutored student outperformed 98 percent of the students in the control group. The average mastery learning student was above 84 percent of the students in the control group. Bloom described the results in another way when he wrote, "90 percent of the tutored students and 70 percent of the mastery learning students attained the level of summative achievement reached by only the highest 20 percent of the students under the conventional classroom" (p. 5). While Bloom discovered that curriculum, instructional materials, and home environment play roles in student achievement, he recommended that teachers should consider using corrective feedback, consider the students' individual learning processes, and consider providing favorable conditions for learning for all students. The individual learning processes is the best ways that students learn.

In another study, Zimmerman and DiBenedetto (2008) noted that a mastery learning formative assessment and adaptive instruction program have not been used in many school

districts even though many states give criterion based summative tests. They wrote the following:

> One notable exception is Dryersburg High School in Tennessee. This school has been designated as a Blue Ribbon School, which is a federal award that recognizes public and private schools throughout the United States that demonstrate superior or dramatic gains in student achievement. (p. 212)

The authors interviewed the teachers and students at Dryersburg High School to validate how mastery learning techniques were used to improve student achievement. One teacher described her work using mastery learning as training the students to be self-teachers. She teaches the lesson, but the students assume responsibility for learning what they do not know through retesting, reviews, and corrections. During the Zimmerman and DiBenedetto (2008) study, a student said, “I have never been good at math, and I have never worked at math. This is the first time I am working at it, and I’m having a lot of success” (p. 214). Another student said that she knew she would do well on her final test because she used the corrective feedback regarding her errors until she reached mastery. Because this confidence was school-wide, neither the students nor the staff had negative attitudes toward the high-stakes testing. The authors summarized, “This model provides teachers with (a) timely feedback about the progress and deficiencies of students meeting specific instructional goals, and (b) with a curriculum that provides extra time and opportunities for all students to gain mastery” (p. 215).

The teachers at Dryersburg High School had seen mastery learning used effectively, and they went to the administration to request permission to implement it at their school. They

were willing to make the extra effort mastery learning requires to better support student achievement.

Wiliam (2006) described three types of feedback loops based on time. The long-cycle goes across marking periods and can be from four weeks to one year long. The medium-cycle is within and between teaching units and can be from one to four weeks. The short-cycle is within and between lessons and can be from five seconds to two days. Corrective feedback is more effective with shorter time cycles because the student can use the feedback on future assignments to attain mastery. The descriptors of the feedback loop are not as important as how the results are used. He wrote, “The crucial feature is that evidence is evoked, interpreted in terms of learning needs, and used to make adjustments to better meet those learning needs” (p. 285).

Assessments, teacher expectations, and student self-assessment. Bangert-Drowns, Kulik, C., and Kulik, J., (1991) studied the effects of assessments on student achievement through forty empirical studies retrieved from ERIC. Thirty-five of the 40 articles studied the effects of frequent classroom testing on criterion examination performance. Twenty-nine studies showed positive effects from frequent testing, and six studies showed negative effects. They reported, “Thirteen of the 29 studies with positive findings reported that the difference in posttest achievement between experimental and control groups was statistically significant” (p. 93). The most dramatic improvement (one half standard deviation higher) in student achievement occurred when students assessed on the material at least once during the instruction were compared to the control group that was not assessed until the final test of the term. Much smaller incremental improvements were noted with each additional test. Shorter assessments

were more effective than longer ones. In addition, four of the studies measured students' attitudes toward instruction following programs of varying test frequency. These students had a more favorable opinion of their instruction when they were tested frequently.

Brookhart's (2001) study explored high school student perceptions about classroom assessment. English and Anatomy classes were the focus of the study. Teachers encouraged and expected students to study for upcoming quizzes. Fifty students were asked what the teachers expected and whether or not it was important to meet those expectations. Most of the students' responses identified a distinct connection between their studying and their learning. This connection was reinforced by their graded assessments. These successful students were exhibiting their understanding that learning is a process. The learning process includes formative and summative assessments. Brookhart concluded with the following:

> They engage in self-assessment as a regular, ongoing process and actively try to fit new information about their learning into their careers as students. They do not make neat distinctions between formative and summative assessment, but use assessment in a variety of integrated ways. (p. 168)

Rubie-Davies (2007) wrote, "Much of the research based on teacher expectations of individual students has shown that teachers have higher expectations for those students with more ability and lower expectations for students with lesser ability" (p. 293). She designed a study to see what role teacher expectations would have on the whole class. She selected 12 primary reading teachers who were known for having low-, average-, or high-expectations for students' achievement. During the study, the lessons were video taped, and every teacher comment was categorized as being related to teaching/learning, feedback, questioning, behavior

management, or procedural. Not only did the students with high-expectation teachers gain the most in reading achievement, but they also enjoyed a positive learning environment. Rubie-Davies concluded with this summary:

> The findings in this study indicate the importance of teachers having high expectations for all students. They show high-expectation teachers constructing a framework for student learning by providing children with sufficient and clear explanations and instructions, by carefully orienting student to the task and by linking new concepts to prior learning. Feedback has been highlighted as a technique used frequently by high-expectation teachers and that is beneficial for promoting student learning. (p. 304)

Ultimately, assessments are supposed to provide information to the students so they can improve their learning. Stiggins (2002) stated that some students come to slay the dragon (assessment) while other students expect to be devoured by it. Students vary in background knowledge, abilities, learning styles, and attitudes toward learning and assessments. He wrote, "Yet, as they attempt to weave assessment into the school improvement equation, federal, state, and local policy makers seem unable to understand or to accommodate this difference" (p. 761).

Brookhart (2008) wrote the following:

> Ideally, both self-assessment (internal feedback) and teacher feedback (external feedback) should help students control their learning. The strategies you suggest and model will become part of the students' repertoire for practicing that skill. Gradually more and more self assessment should occur: as concepts become more familiar,

students come up with their own learning strategies and less teacher feedback is needed. (p. 58)

Black and Wiliam (1998) searched for evidence that showed that formative assessment makes a difference in student achievement. Their search included over 580 articles or chapters. As mentioned above, their findings declared a resounding yes that formative assessment is effective in raising student achievement. In addition, “Many of these studies arrive at another important conclusion: that improved formative assessment helps low achievers more than other students and so reduces the range of achievement while raising achievement overall” (p. 141). Black and Wiliam highlighted three key teacher assessment actions: involve the students in the classroom assessment process, increase teacher’s descriptive and specific feedback, and decrease evaluative feedback. Black and Wiliam (1998) say that effective feedback can positively affect the learners’ beliefs about their own capacity for achievement.

In another study, the teachers in a rural school district in western Pennsylvania focused on formative assessment to improve communication and cooperation rather than focusing on traditional assessment practices that express judgment and foster competition (Brookhart, Moss, Long, 2008). Black and Wiliam (1998) strongly recommended this shift in the use of assessments. Not only did state test results improve, but students also took ownership of their learning. Specifically, this rural school district’s teachers focused on the students’ abilities to self-assess their learning progress.

In the lower grades, students worked with flexible centers using flash cards or word cards in which green (good), yellow (hesitated or self-corrected), or red (incorrect) sheets were used to place the flash cards after each response. The students quickly realized which word cards they

needed to review. In another reading exercise, one first grader understood the concept that repeated reading improves oral fluency and took ownership. His take-home reading card came back the next day signed six times. When he was asked about all the signatures, he explained that he was trying to become fluent. In the upper grades, the teacher guided the students to use rubrics and checklists to develop self-assessment abilities. The students realized what they needed to work on and what they had mastered. Black and Wiliam (1998) stated, “This link of formative assessment to self-assessment is not an accident; indeed, it is inevitable” (p. 143).

Assessments, teacher expectations, and student self-assessment are examples of effective formative assessment. Teachers can use these examples to help students achieve.

Motivation. Sullo (2007) commented on motivation when he wrote, “Internal control psychology is based upon the belief that people are internally, not externally, motivated. Our genetic structure drives our behavior” (p. 7). This is also known as choice theory. He said that rewards and punishments only provide us with information. They do not really make us do anything. We have a free will and personal responsibility. He added that if you want lasting change, ask more self-evaluation questions. As an example, he shared how a school counselor discussed motivation with students. The counselor would get the students to think about something they wanted. When they came up with a goal, she would see how much effort they were willing to put forth to be successful. This process often gave the students adequate motivation to succeed.

Zimmerman and DiBenedetto (2008) showed that success will motivate students to work harder. Stiggins (2002) noted that educators using formative assessment can motivate students to keep trying to learn.

Schuetze (1957) stated that motivation is not simply a matter of the mind, but of the heart. The Christian student is motivated by God's love or, more specifically, the means of grace – God's Word and the sacraments. He emphasized the importance of Baptism this way:

> But too often neglected in not continuing to apply its salutary purpose and significance to ourselves throughout our lifetime. Is not there the danger that we think of Baptism as a one-time thing, something that was once performed and is then relegated to the past as something rarely called to mind? But how we rob ourselves of spiritual blessing if we thus forget about our Baptism. What a power it should be to instill in us a continued love to God and a growing desire to serve him. (p. 124)

Christian children can daily be assured of God's love and forgiveness through their baptisms.

Cumulative practice, tiered feedback, feedback plus solution sequence instruction, review practice, and transfer training. Mayfield and Glenn (2008) evaluated the effectiveness of five examples of formative assessment to assist Algebra students in developing their own problem solving skills with exponents and linear equations. The subjects in this study were three students who were eligible for special education services. The authors designed the project to have skill sets and task sets. The skill sets were practice activities, and the task sets were summative assessments of the skills. There was a monetary incentive for any correct answer. The five examples were 1) cumulative practice, 2) tiered feedback, 3) feedback plus solution sequence instruction, 4) review practice, and 5) transfer training. As you will notice, each successive intervention becomes more supportive of the students' learning. 1) Cumulative practice included participants completing fifteen cumulative practice problems. The experimenters provided praise for correct responses and feedback. The students then took the

summative assessment. 2) Tiered feedback had three levels of feedback. In the first tier, the subjects were told only how much money they earned from their correct responses on their last test. The subjects then took the summative test. In the second tier, the experimenters told the students that the multiple choice answers highlighted in yellow were correct, and the subjects should determine the correct methods to solve the problems. The subjects then took the summative assessment. In the third tier, the experimenters highlighted correct answers and told the incorrect pattern or method the participant was using on incorrect answers. However, the correct method for solving the actual test problems was never shared. The subjects then took the summative assessment. 3) Feedback plus solution sequence instruction on problems similar to the test items was provided next. The experimenters read and placed procedural steps before the participants reminding them to use the rules they had learned. The subjects then took the summative assessment. 4) Review practice was the next intervention in which the experimenters reviewed the target skill with two practice problems. Participants independently solved fifteen practice problems. Praise was given for correct responses and feedback was given for incorrect responses. The subjects then took the summative assessment. 5) Transfer training involved transferring the stimulus from correct responses on the target skills to the problem solving tasks. Sequence transfer steps were developed for each task and prompts were tailored for each participant. Before each of the summative tasks, participants were reminded how much money they had earned, but there was never any direct modeling or feedback for the actual summative task solutions. The subjects then took the summative assessment.

As stated above, the formative assessment examples used in this study progressed from least intensive to most intensive. In this way, the experimenters could determine the least

amount of intervention necessary to meet the criteria. It should be noted that examples related to explicit instruction were not evaluated because this would "undermine the study's goal of producing novel behavior that is *not* directly trained" (p. 280).

Mayfield and Glenn (2008) used baseline test scores before they began and after each intervention over the course of nine months with typically four experimental sessions per day up to five days a week (435 total sessions). The number of sessions increased as the type of intervention became more supportive of the students' learning. Participants attained exponent or linear equation mastery on each level by attaining three nonconsecutive scores of 100%.

Overall, students' achievement levels generally improved. Specifically, 1) cumulative practice was initially effective in developing the student's own problem solving skills. However, these particular students were unable to consistently produce high accuracy on these types of problems without additional intervention. The next three examples produced little or no significant improvement to the level already achieved by cumulative practice. In summary, the authors stated, "Providing informational feedback alone without incorporating other elements of explicit instruction (i.e., immediate, specific error correction procedures) is not sufficient to improve problem solving" (p. 296). The most effective intervention in this study was the more structured transferred training. Transfer training built on concepts understood by the students to help them understand new concepts and included sequencing of steps and individualized supplemental prompts. As the students grew in achievement, unneeded prompts faded. After an average of nine transfer training sessions, the students demonstrated mastery by consistently producing 100% on three nonconsecutive summative assessments.

Peer assessment with feedback. A unique study was done on the effectiveness of formative peer assessment with twenty-seven college students in a computer supported collaborative learning environment. The narrow focus of the study was to evaluate student attitude and use of peer assessment. Prins, Sluijsmansman, Kirschner, and Strijbos (2005) divided the students into four groups and trained three of the four groups on the use of formative peer assessment in a mini course. The control group did not participate in the mini course and worked on the assignments with tutor support. Each group was given writing assignments with a scoring rubric. The authors encouraged the groups to communicate through Blackboard, an electronic discussion board. The four groups were to conduct research and write one group report for their first major group assignment. The groups would then exchange reports, and, as a group, use three assessment parts. They were 1) discuss the assessment criteria, 2) assess a draft of their own report and assess a draft of the report of another group in the study, and 3) write a reply to the group indicating how the report was revised according to the assessment. In their qualitative analysis, the authors stated the following:

> When students are involved in peer assessment according to our perspective, they have to communicate in groups, communicate between groups, negotiate about criteria, exchange products in time, and so on. For these activities, complex collaboration skills and social skills are needed. However these skills do not magically appear when tasks are employed in which students are expected to collaborate. Providing an online mini course on collaboration skills, as we did in the European virtual seminar course, may not have been sufficient to establish a sufficient quality of students' collaboration skills. (p. 437)

As an example, they noted that some of the students did not provide feedback correctly or as often as required, and some students had difficulties receiving critical feedback. The subjects in this study did not communicate nearly as much as the authors had hoped. They partially blamed this on the inadequate amount of practice with the electronic discussion board and training in peer assessment. As a result, the authors recommend adequate training in peer assessment and communication before expecting improved achievement resulting from peer assessment.

In summary, the literature presented the following examples of formative assessment: teacher training/professional development, learning goals, quality teacher and student interactions, multiple assessments tied to tailored instruction, flexible schedules, equal access to learning to all students, mastery learning, corrective feedback, students' learning processes, assessments, teacher expectations, student self-assessment, motivation, cumulative practice, tiered feedback, feedback plus solution sequence instruction, review practice, transfer training, and peer assessment. The research studies in many of the articles showed effectiveness of many of the examples. Their effectiveness will be discussed in the next section. The researcher will also share the examples he believes will be most beneficial to him in his ministry.

Utilizing and Applying the Effective Examples of Formative Assessment

Introduction

In this final section of the paper, the researcher will first discuss the results of literature review by identifying examples of effective formative assessment that have been shown to improve student achievement. He will then share the examples of formative assessment that he has chosen to apply to his ministry. Then the researcher will share what he believes to be the

best ways to use the results with his colleagues and students in his setting as teacher and principal. He will also propose suggestions for the reader and teacher training institutions.

Utilizing the Effective Examples of Formative Assessment

By teachers. The researcher learned that teachers need training and support to understand and implement formative assessment (Rourke, 2006; Yin et al., 2008; Prins, Sluijsmans, Kirschner, & Strijbos, 2005). However, Stiggins (2002) noted that formative assessment training for educators or principals has been almost nonexistent for decades. Wiliam (2006a) would add that improving teacher quality is the key to raising student achievement, and teacher quality is improved through effective teacher training/professional development. He wrote the following:

> What we're finding is that as well as making teaching more fun, and revaluing teacher professional expertise, formative assessment turns out to have some of the biggest impacts on student achievement, so not only will you get better test scores, you'll actually enjoy your teaching more. (p. 13)

Brookhart, Moss, and Long (2008) realized that most people will not successfully implement new strategies just by hearing about them. They utilized The Teaching as Intentional Learning model for teacher support. They regularly scheduled meetings over the three-year period to address questions as they arose.

The teacher sets the tone in the learning environment. In a classroom using formative assessment, constructive criticism is expected and mistakes are recognized as opportunities to learn. Brookhart (2008) wrote, "You express this attitude in your tone of voice and type of

comment, in the opportunities for revising work and demonstrating improvement that you provide, and in your handling of that improvement" (p. 59).

Zimmerman and Dibenedetto (2008) showed that training may not be enough. The mastery learning program implemented at Dryersburg High School was successful because the teachers had seen it work, and they believed they too could use it successfully. The teachers were willing to work extra hard to enable their students to improve their achievement.

Black & Wiliam (1998) pointed out that teachers need to know about their students' progress and difficulties with learning so that they can adapt their own work of planning lessons to meet the students' needs. Teachers need to have dialogue with individual students to understand where they are in their learning. Tomlinson (2008) put it this way, "I began to grasp that teaching requires a plural pronoun. The best teaching is never so much about 'me' as about 'us'" (p. 11). Brookhart, Moss, and Long (2008) showed the benefits in their study when teachers and students communicate and cooperate. The students became more motivated and took ownership of their learning.

Many teachers, like students, are nervous about assessments, but the literature shows them how to learn from formative assessment and prepare for summative assessments. The work of Bangert-Drowns, Kulik, C. & Kulik, J. (1991) showed that frequent testing improves student achievement. Frequent testing provides more opportunity for teachers and students to realize what students do not know and to take steps to close the achievement gap. There needs to be a paradigm shift in the way some teachers and most students view assessments. It only seems logical that teachers would take the lead because they are the most responsible for what occurs in their classrooms. Wiliam (2006) wrote, "but the pressing need now is to move teachers

to action" (p. 288). Black and Wiliam (1998) and Brookhart (2002) noted that each learner is unique and bases new learning on previous learning experiences and on future goals and interests. Wiliam (2006a) encouraged teachers to make small changes when implementing formative assessment. Otherwise, they may fail and go back to their old habits. Teachers do well to understand each child and use each student's assessments to modify their own plans, instruction, and constructive feedback so each student begins to internalize the whole learning process and makes similar adjustments to his or her learning.

By students. Taras (2002) pointed out that feedback is not a one-way system of information. The student needs to be an active participant and use the information to close the learning gap. In the Mayfield and Glenn (2008) study, transfer training was the most effective. Even though they did not call this feedback, it seems to this researcher that it was. As the researcher evaluated what they were doing, assessing where the students were (what they knew) and then providing more information that the student could use to improve learning (immediate descriptive feedback), he realized that this is exactly the type of feedback that was found to be most effective in the empirical study by Black and Wiliam (1998).

Motivating students is a concern of all good teachers. Stiggins (1999) wrote, "Learners who come to believe that failure is inevitable develop a sense of futility" (p. 195). Student motivation can determine the student's attitude and effort toward achievement. Rubie-Davies (2007) stated that teachers who have high expectations for their students, often give positive feedback, and students perceive this as caring and are thus motivated to work harder. Christian students find motivation from God's love through Jesus. Their baptism can be a daily reminder

of God's unconditional love. In the Christian classroom, the teacher can model this type of motivation.

By the researcher. I think assessments, student and teacher interaction, feedback, student motivation, student self-evaluation, and teacher training are the most important examples of effective formative assessment for my ministry. As the literature review showed, assessments and feedback are commonly used in formative assessment. I want to encourage my students to use self-evaluation because it will help them develop more motivation and help them become better learners. Teacher training is an important example because the teacher directs the learning and assessment in the classroom, and because I concur with Wiliam's (2006a) statement that teacher quality is the key to student achievement. Formative assessment reminds me of the popular poster which says, "Please be patient with me because God is not done with me yet."

Applying the Effective Examples of Formative Assessment

To students. Many children enter school eager and excited about learning. Why do many students lose that eagerness to learn? One might think that all the testing is to blame, but as Bangert-Drowns, Kulik, C., & Kulik, J., (1991) showed, testing improves achievement because the additional tests emphasize the targets and provide opportunity for feedback. However, it is important to tie the assessments to constructive feedback (Black & Wiliam, 1998; Stiggins, 1999; Pedersen, Arslanjilmaz, & Williams, 2007; Zimmerman & DiBenedetto, 2008). In Brookhart's (2001) study of successful students using assessments, she verified that good students transfer knowledge across the curriculum.

It is encouraging that formative assessment was shown to raise the level of the lower achieving students the most (Black & Wiliam, 1998; Yin et al. 2008). I think self-assessment is an important skill for the struggling learners to acquire. They could realize what they do not know compared to the learning goals and could take steps to learn. I think this would help them take more ownership of their learning.

Motivation is another example of effective formative assessment as illustrated by the student from the rural Pennsylvania school (Brookhart, Moss, & Long, 2008). One student was working on improving his reading ability and realized that the reading practice would help him achieve his goal, so he took ownership of the learning. I can imagine how he worked to improve each of those six times he read. That is amazing student motivation. Sullo (2007) encouraged the use of student self-evaluation. Student behavior is often controlled by punishments and rewards. When these are removed, some students are not sure what to do because they have never felt a sense of control in their lives. When students evaluate their behavior, they begin to take responsibility for their actions. They begin to realize which actions help them achieve their goals and which actions are counterproductive. As they realize the connection between their actions and achievement, they become motivated to work harder on the behaviors that will help them reach their goals.

Christian children have God's love in their hearts as the greatest source of intrinsic motivation. Schuetze (1957) stated that through baptism their sins have been washed away, and they are sons and daughters of God.

To the researcher as a teacher. The Yin et al. (2008) experiment used regular classrooms, like mine, whereas much of the empirical evidence comes from either laboratory studies or

anecdotal records. This experiment illustrated the challenges of controlling the different learning variables in any given classroom. If I try to implement too many examples of formative assessment at one time, I might fail. I will do well to remember what Wiliam (2006a) said about making small changes as I implement formative assessment in my classroom. I will need to be clear in my lesson presentations so students understand the desired results. For example, when I purposely implement feedback, I will repeat that I want them to use the information to improve their work and develop their own way of self-assessment.

In the past, when I discussed upcoming summative assessments with my seventh and eighth grade students, they were generally anxious. I realize that my teaching could have been more supportive. I would carefully and faithfully teach the lessons and then expect them to study whatever they did not understand. I might have a mini-lesson with students and then have them redo a section of an assignment to show understanding. I would answer any questions, but there were usually too few. I have realized that students, especially struggling ones, often do not know how to fix what they got wrong. Through this research project, I realized the powerful role of knowing the learner and using timely, corrective feedback in promoting student motivation and achievement. Presently, I point out to them that our summative assessments contain the same material as the formative assessment assignments we worked on in class. I regularly remind them, “We are in this together. How can I help?” I often tell my students that the upcoming chapter test should be a celebration of learning. After all, we have practiced the types of problems that will be on the test, and they have been successful.

I will strive to support learning through my clear communication and sensitive tone (Brookhart, Moss, & Long, 2008; Black & Wiliam, 1998). I will continue to reflectively evaluate

my daily practice and, especially, my interactions with my students to provide more meaningful learning opportunities. The work of Prins, Sluijsmans, Kirschner, and Strijbos (2005) reminds me to give the students opportunity to practice peer assessment and communication skills

To the researcher as a principal. Teacher training, assessments, and feedback are examples of formative assessment related to specific teacher behaviors. The evidence from the literature review on the effectiveness of formative assessment is undeniable. As I present formative assessment to my staff, it is very encouraging to have research data ready to share. I think my staff will want to know how to get started. Formative is often used as "formative years" referring to the time when someone is finding their way in a career or life. Teachers might appreciate the following analogy by Wiliam (2006). He wrote, "In the same way that our formative experiences are those experiences that shape us as individuals, formative evaluations are those that shape whatever is being evaluated" (p. 284). I think my colleagues and I are still being shaped as we pursue professional development. I will remember how Rourke (2006) stated that all the other cornerstone strategies are built on teacher training.

The study by Zimmerman and Dibenedetto (2008) reminds me that it is better for the teachers to try something out to determine if it would be useful for them than for me to make the decision without their input. It also showed me that teachers will work hard on something they believe in. In contrast, some of the teachers that worked with formative assessment embedded in their curriculum (Yin et al. 2008) did not bother to follow the prompts because they did not see their value. Some teachers may think they do not have time. Dodge (2009) said that she hears that all the time at her workshops. She pointed out, "Without time to reflect on and interact meaningfully with new information, students are unlikely to retain much of what is

'covered' in their classrooms" (p. 4). Because my colleagues are experienced, effective teachers, I am confident that I can use their current teaching to illustrate effective examples of formative assessment they are already doing and encourage them to build on what they have done. In the Yin et al. (2008) study, teachers used assessment and feedback even though they were not trained. It seems that good experienced teachers can sense when and what to give students to support their learning. I think my staff will welcome training on these examples of formative assessment.

I am planning to use Susan Brookhart's (2009) *Exploring Formative Assessment* workbook to help me present formative assessment at future faculty inservices. I appreciate her goals for her workbook which she stated as, "Increase teacher knowledge and skill in formative assessment and increase student motivation and achievement" (p. 1). I think my colleagues will readily adopt these worthwhile goals. I think the workbook will not only be a useful tool in training us, but also a useful tool in supporting our efforts. I will continue to encourage their interest and efforts by discussing our successes and challenges individually and in our faculty meetings. I will also work with the school board to provide funding for worthwhile workshops or classes on formative assessment. I pray the Lord would continue to bless their efforts and mine.

The formative and summative assessments concept could work well while supervising teachers as part of the Team Ministry Program. During a visit in the early part of the school year, a concern may be discussed. The teacher and I could brainstorm some possible solutions. The teacher can implement some of the solutions to see if the situation improves. Teacher feedback and my continued support could be provided during future conferences.

Popham (2008) warned that some test publishers will market materials for benchmark tests and call them formative assessment, but many of these tests are not formative in the sense of the research evidence of Black and Wiliam (1998). I will keep this in mind when I order materials that will support the efforts of my colleagues and me as we implement formative assessment.

Many curriculum authors integrate formative assessment. One example uses technology and the game show glitz to actively involve the students in a chapter review. The students are placed on teams and can interact to finalize their answer. All the students would be discussing the learning goals. This would improve and promote communication skills and be an excellent review. Some students may be motivated to study for the game show review. Could this actually become the thing to do? Not only would they lead their team to victory, but they would also be more successful on the subsequent summative assessment. I am looking forward to finding more examples of formative assessment integrated into the curriculum.

To teacher training institutions. The literature review of formative assessment mentioned the need for teacher training (Brookhart, 2008; Brookhart, Moss, & Long, 2008; Dylan & Wiliam, 1998; Yin et al. 2008). College coursework could show teacher candidates the value of formative assessment and even give them opportunities to practice the skills. Instructors of pre-service teachers would do well to point out to their students the examples of formative assessment in their own teaching. Students would then have the opportunity to reflect upon the value these assessments in their own learning.

During their pre-service experiences, the students could identify various examples of formative assessment. Steps could be taken to implement formative assessment into the first

lessons they write. For example, Martin Luther College has a template for student teachers to use as they write lesson plans. The template includes a section called lesson reflection. The student teacher is to consider how effective the lesson was and consider what could be changed in the lesson to improve it. This section also asks the student teacher to identify who might need extra help and what type of help might be needed. The student teacher's supervisors can then review the comments and provide further encouragement. I think this process would help a new teacher implement formative assessment. I think this section of the student teacher's lesson plan template includes the following formative assessment examples: self-assessment, corrective feedback, learning goals, and student's learning process. The student teachers will realize the value of formative assessment during the pre-service experiences so the practice becomes part of their lesson planning and classroom practice.

In summary, the literature review showed the need for formative assessment and provided many useful examples. Several authors stated that formative assessment is the best way to impact student achievement. Through formative assessment, students could become more aware of their roles in the learning process and assume more responsibility for their learning. These students would be on their way to becoming life-long learners. Pre-service teachers can learn the value of formative assessment at teacher training institutions and through their observations of classroom teachers who use formative assessment. In their pre-service teaching, they can learn first hand the effectiveness of formative assessment by implementing these examples. Veteran teachers may be encouraged by the fact that their instinctive feedback which supports students in their learning is supported by the research articles used in this paper. Veteran teachers may be interested in learning how to implement

other effective examples of formative assessment. Christian teachers can use formative assessment to nurture God's lambs for this life and the life to come. Implementation of formative assessment rests squarely on the shoulders of the teachers because no one else is more responsible for daily practice in their classrooms.

References

Bangert-Drowns, R., Kulik, C., & Kulik, J. (1991). Effects of frequent classroom testing. *Journal of Educational Research, 85*, 89-99. Retrieved March 30, 2009, from the EBSCO database.

Black,P., & Wiliam, D. (1998). Inside the black box: raising standards through classroom assessment. *Phi Delta Kappan, 80,* 139-148. Retrieved March 30, 2009, from the EBSCO database.

Bloom, B. (1984). The search for methods of group instruction as effective as one-to-one tutoring. E*ducational Leadership, 41*(8), 4-17. Retrieved March 18, 2009, from the EBSCO database.

Brookhart, S. (2001). Successful students' formative and summative uses of assessment information. *Assessment in Education, 8*, 153-169. Retrieved April 5, 2009, from the EBSCO database.

Brookhart, S. (2008). *How to give effective feedback to your students*. Alexandria, VA: Association for Supervision and Curriculum Development.

Brookhart, S. (2009). *Exploring formative assessment.* Alexandria, VA: Association for Supervision and Curriculum Development.

Brookhart, S., Moss, C., & Long, B. (2008). Formative assesment that empowers. *Educational Leadership, 66*(3), 52-57. Retrieved March 16, 2009, from the EBSCO database.

Dodge, J. (2009). *25 quick formative assessments for a differentiated classroom.* New York, NY: Scholastic, Inc.

Heritage, M. (2007). Formative assessment: What do teachers need to know and do? *Phi Delta Kappan, 89,* 140-145. Retrieved March 30, 2009, from the EBSCO database.

Holloway, J. (2001). The use and misuse of standardized tests. *Educational Leadership, 59*(1), 77-78. Retrieved March 18, 2009, from the EBSCO database.

Klein, J. (2010, February 8). Failing our schools. The government has billions to spend on public education, but teachers' unions are standing in the way. *Time, 175*, 20.

Kuske, D. (1987). The principles of the teaching/learning process applied. Retrieved December 28, 2009, from Wisconsin Lutheran Seminary Essay Library at www.wlsessays.net

Mayfield, K., & Glenn, I. (2008). An evaluation of interventions to facilitate algebra. *Journal of Behavioral Education, 17,* 278-302. Retrieved December 29, 2009, from the EBSCO database.

Pedersen, S., Arslanyilmaz, A., & Williams, D. (2009). Teachers' assessment-related local adaptations of a problem-based learning module. *Educational Technology Research & Development, 57*, 229-249. Retrieved April 5, 2009 from the EBSCO database.

Popham, W. (2008). *Transformative assessment*. Alexandria, VA: Association for Supervision and Curriculum Development.

Prins, F., Sluijsmans, D., Kirschner,P., & Strijbos, J. (2005). Formative peer assessment in a CSCL environment: a case study. *Assessment & Evaluation in Higher Education, 30*, 417-444. Retrieved December 26, 2009, from the EBSCO database.

Richards, E. (2010, February 12). State details MPS failures. *Milwaukee Journal Sentinel*, pp. A1, A5.

Rourke, J. (2006). *Breaking ranks in the middle: Strategies for leading middle level reform.* Reston, VA: National Association of Secondary School Principals.

Rubie-Davies, C. (2007). Classroom interactions: Exploring the practices of high- and low-expectation teachers. *British Journal of Educational Psychology, 77*, 289-306. Retrieved March 30, 2009, from the EBSCO database.

Schuetze, A. (1957). Motivation. Retrieved April 16, 2010, from Wisconsin Lutheran Seminary Essay Library at www.wlsessays.net

Stiggins, R. (1999). Assessment, student confidence, and school success. *Phi Delta Kappan, 81,* 191-198. Retrieved September 7, 2008 from the EBSCO database.

Stiggins, R. (2002). Assessment crisis: The absence of assessment for learing. *Phi Delta Kappan, 83,*758-765. Retrieved March 30, 2009, from the EBSCO database.

Stiggins, R., Arter, J., Chappuis, J., & Chappuis, S. (2007). *Classroom assessment for student learning.* Upper Saddler River, NJ: Pearson Education, Inc.

Sullo, B. (2007). *Activating the desire to learn*. Alexandria, VA: Association for Supervision and Curriculum Developpment.

Taras, M. (2002). Using assessment for learning and learning from assessment. *Assessment & Evaluation in Higher Education, 27*, 502-510. Retrieved April 5, 2009, from the EBSCO database.

Tomlinson, C. (2008). Learning to love assessment. *Educational Leadership, 65*(4), 8-13. Retrieved March 2, 2009, from the EBSCO database.

Wiliam, D. (2006). Assessment for learning: Why, what and how. Unpublished manuscript, University of Cambridge.

Wiliam, D. (2006). Formative asessment: Getting the focus right. *Educational Assessment, 11*, 283-289. Retrieved December 26, 2009, from the EBSCO database.

Yin, Y., Shavelson, R., Ayala, C., Ruiz-Primo, M., Brandon, P., Furtak, E., Tomita, M., & Young, D. (2008). On the impact of formative assessment on student motivation, achievement, and conceptual change. *Applied Measurement in Education, 21,* 335-359. Retrieved December 26, 2009, from the EBSCO database.

Zimmerman, B., & DiBenedetto, M. (2008). Mastery learning and assessment: Implications for students and teachers in an era of high-stakes testing. *Psychology in the Schools, 45*, 206-216. Retrieved March 30, 2009 from the EBSCO database.