ASSESSMENT METHODS USED BY TECHNOLOGY EDUCATION TEACHERS IN SOUTHEASTERN WISCONSIN HIGH SCHOOLS

by

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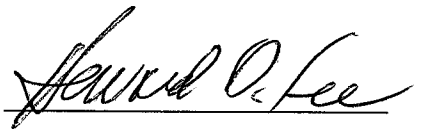

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ABSTRACT

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This descriptive research study provides data about traditional and alternative assessment practices among high school technology education teachers in Southeastern Wisconsin. Traditional and alternative forms of assessment strategies and data about the subject's assessment effectiveness are provided.

Among traditional assessment methods, multiple choice, matching, and completion or fill in the blank are used most by this population in that respective order. True and false are not used much and essay questions are used even less.

Of alternative methods, observation techniques, performance assessments, and student self assessments are used the most in that order. The subjects responded to using portfolios sometimes only 27% of the time. Almost 55% of the subjects thought their assessments are useful, but almost 33% thought they were only somewhat useful.

Data may be used to suggest recommendations to help technology education teachers use assessment methods more effectively to increase learning. Universities may use the data to advise and council students preparing to become technology education teachers.

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Chapter I Introduction and Background

Teachers are expected to perform many tasks in today's classrooms. One such task is to perform assessments of their students on an ongoing basis. To perform this task effectively, it creates a challenge and a need for competent strategies to make proper judgements. Teachers work under difficult conditions (Merrow, 2001). It's stressful to be in a classroom of young adolescents and seek to maintain control and manage the learning of as many as 20-30 students. Because assessment of student learning is a regular part of classroom routine, teachers typically devote a sizable amount of classroom time to such endeavors. Effective teachers strive daily to identify gaps in their students' knowledge and understanding, correct mistakes, and continually seek new and better ways of communicating knowledge (Simpson, 1999).

The past two decades have witnessed important advances in the assessment community's ability to develop new tests that produce precise information of student achievement. In the past decade, there has been a heavy focus on developing tests to measure student's knowledge as it pertains to high stakes testing that's used to measure and compare school districts, a state's educational overall effectiveness, and the like. So much focus has been on the development of sophisticated psychometrics and test tactics for high-stakes testing that people have almost completely ignored the 99% of the assessments that happen everyday in a student's life in the classroom (Stiggins, 1999). Furthermore, teachers appear to lack expertise in test construction, and they do not always use valid grading strategies. Many teachers do not provide criteria for grading or examples of expected work ahead of time. Most studies have concluded that teachers need more instruction in daily assessment strategies, (Brookhart, 2001). These are the

assessments created and used by teachers in the classroom. These types of assessments would help teachers gather information of student learning on a day to day basis and permit teachers to use the information to benefit their students. Instructors at all levels constantly make decisions about how to improve their teaching. But even faculty who value student learning can find to make the connection between what they do in the classroom and the continuous improvement philosophy (Carey & Gregory, 2003). Without high-quality classroom assessment, instruction cannot work, and schools cannot be effective (Stiggins, 1999). Fortunately, methods of assessment are being examined for more variety and authenticity to the measurement of student's performance (Garger & Guiled, 1998).

Although knowledge is necessary for success, students must also acquire other skills such as: the ability to communicate, think critically, problem solve, and be self-directed learners (Foriska, 1998). Stretching learning from content to include other skills and behaviors requires more sophisticated assessment measures that have commonly been used. What occurs in most schools and colleges is a ritual pretense that lacks substance. Simple test scores and memorized facts mean little (Campbell, 2000). Authentic assessments has been explored by researchers and teachers. Such assessments include genuine, useful, applicable, practice-based, transferable, and demonstrable items (Hansen, 1998). Students under such assessments combine information gleamed from the classroom and can carry it beyond. A student's skills, knowledge, and attitudes can be assessed by creating learning experiences where the student learns by doing, completing, or creating something that relates to the real world in which they live.

Authentic assessment research shows some positive results for students and society. But, are teachers capable of developing and administering such assessments?

Few teachers are prepared to face the challenges of developing effective classroom assessment because they haven't been given full opportunities to learn to do so (Stiggins, 2002). Teachers rarely have the opportunity to learn how to use assessment as a teaching and learning tool. As a result, there is the danger that student progress may be mismeasured in classrooms across America. Only about a dozen states require competence in assessment as a condition to be licensed to teach. Moreover, there is no licensing examination in place at the state or federal level that verifies competence in assessment. Many educational systems fail to provide the assessment literacy required to enable teachers to effectively engage in assessment to help the learning process (Stiggins, 2002).

Without effective classroom assessment, instruction is not as effective, and schools are not as efficient. In light of the information found, a problem exists. Many teachers are not well informed and been given opportunities to learn how to develop and administer daily classroom assessment strategies. Specifically, the researcher has not found information or research on whether high school technology education teachers in Wisconsin are using effective classroom assessment methods and strategies.

Statement of the Problem

Review of the literature has suggested many teachers are not effectively using assessment methods to assess classroom learning and many techniques used were poor and inadequate (Mertler, 2000). No research has been conducted to determine what methods

and strategies technology education teachers in Wisconsin are using to assess classroom learning.

Research Questions

This study sought answers to the following questions of technology education teachers in Southeastern Wisconsin:

1. What are the traditional forms of assessment in technology education classrooms?
2. What alternative forms of assessments are used in technology education classrooms?
3. How effective do technology education teachers view their assessments?
4. What are the differences among the subjects in the sample related to:
    a. a teacher's number of years teaching
    b. a teacher's educational level attained

Purpose of the Study

The literature suggests that some teachers are not effectively utilizing assessment methods and strategies to their fullest potential. The data gleamed from this descriptive study gives insight into current traditional and alternative assessment practices among technology education teachers of high schools in Southeastern Wisconsin. Further, the data are used to advance relevant discussion and recommendations concerning the effective use of assessment methods and strategies in technology education classrooms.

Significance of the Study

This descriptive study has significant impacts on the following areas of educational systems and practices.

1. Data from the study may be used to describe assessment practices of technology education teachers in Southeastern Wisconsin high schools. Specifically, data was compared to whether these teachers used traditional and or alternative forms of assessment compared to variables of their educational level achieved and number of years teaching.
2. Overall data may be used to suggest recommendations to better equip technology education teachers to effectively utilize assessment methods and strategies to increase learning in the classroom.
2. Teacher educational institutions such as UW-Stout and other universities can use the data to advise and counsel students preparing to become technology education teachers.
3. The Wisconsin Department of Instruction can use the data to improve their understanding and counseling of technology education teachers in Wisconsin.

Scope and Delimitations of the Study

Scope of the study was arbitrarily narrowed to focus on classroom assessment only. Specifically, the study focuses on assessment methods or strategies used by teachers in a classroom setting. As stated in the problem statement, many teachers are not effectively utilizing current alternative assessment techniques. Thus, the study has sought to find out what assessment methods are being used by teachers. This is a descriptive study and the results will be measured and reported using statistical measures of central tendency.

Furthermore, the study is limited in the range of subjects studied to include only technology education teachers in high schools in Southeastern Wisconsin. The researcher

has particular interest in studying technology education teacher's methods or strategies of assessment because the nature of what is taught in technology education classes lends well to many alternate forms of assessment as opposed to traditional forms of classroom assessment.

Definition of Terms

Assessment:

An ongoing process of observing, interpreting, and recording achievement. For this study, the assessment process relates to classroom learning and is sensitive to individual learning differences among students.

Evaluation:

Is linked with objective measurement and is more summative in task with a purpose of identifying a level of learning. It leads to categorization of students of who earns what level of grade and is not sensitive to individual learning differences.

Traditional Assessments:

These forms of assessments would include paper and pencil objective tests that include questions such as true or false, multiple choice, short answer, and the like.

Alternative Assessments:

These forms of assessment would include portfolios, group or individual performance tasks of an authentic nature, open ended questions or projects, student self assessment methods, and the like.

High Stakes Testing:

The once a year standardized tests that students take to compare and contrast students academically among schools, school districts, states, and to develop national averages to ultimately evaluate educational systems at respective levels.

Chapter II Literature Review

Chapter two will review evaluation methods used and new evaluation strategies being researched. The traditional methods that have been used by educators for a long time will be reviewed. Subjective evaluation methods will also be explained. Alternative evaluation strategies will also be investigated as a possible tool in evaluating student's learning. Lastly, research and studies will be reviewed that are relevant to this study on evaluation of student learning.

Perhaps what has helped drive the search for better ways to evaluate students' learning is educational accountability. Significant time and energy has been dedicated to find out what students know and are able to do (Lammel, 1999). Since the accountability movement began in the 1950s, how to effectively evaluate what a student knows and can do has become more complex. Social and political pressures have added to this evaluation by standardized tests and the comparison between school districts and state educational systems. However, this study is not about standardized testing and the host of debates that surround its meaning. This study is about effective ways to evaluate student's learning in technology education.

Traditional Assessment Methods

A purpose for using evaluations in the classroom is to improve instruction. Obviously, a teacher needs to assess how well students have learned the subject matter of the course or to assess if students can perform tasks and assignments according to expectations. Once such information is retrieved, a teacher can make decisions as to what areas of subject matter need to be re-taught and if they are ready to move on to the next unit of study. Naturally, it gives teachers an objective basis for determining grades too.

To evaluate students' learning, many methods can be used. The traditional method of evaluation used by teachers has been the strategy of objective testing. Traditional methods have been used for a long time and are familiar to students. However, there are advantages and disadvantages to each of these objective types of testing. These traditional methods include true and false, questions, multiple choice questions, completion or fill in the blank questions, and matching type questions.

True-false Questions

The true or false question has been used by most teachers at all levels of education. Thus, students are aware of expectations and how they are to answer them. The true-false question is popular among teachers because of its ease of construction and its ability to evaluate a wide range of subject matter. Also, this type of question does not take students long to respond to. Thus, many true-false questions can be answered in a short time and covers a broad range of subject matter. Coupled with this questions ease of correcting, it provides teachers with a quick and relatively easy way of evaluating students on a lot of information that does not require a lot of time. It provides a fast way

to check students' knowledge before moving on. Short quizzes to check students' knowledge of a previous days lesson would be an example. However, there are some disadvantages in using true-false questions.

Because student are so familiar with such questions, they learn the weaknesses in many true-false items and are then able to score well by recognizing how the question was constructed using certain words and the like. Another limitation of these types of questions is that they encourage students to guess at the correct answer. Depending on the subject matter, many times it is difficult to construct a true-false question that is completely true or completely false. As mentioned earlier, students see this type of question so much, they become wise to grammatical clues as to whether the question is true or false. Thus, students may answer these types of questions correctly without having much knowledge of the subject matter.

Lastly, true-false tests are usually low in reliability unless there are a large number of such questions on the test. As with any test construction, teachers need to weigh the advantages and disadvantages in using certain types of test questions. True-false type questions are quick to construct, easy to correct, and are familiar to students to answer. But, in light of the disadvantages mentioned, these types of questions should be used sparingly. Their use should be specific and not summative in nature as to the subjective matter.

Multiple choice questions

Multiple choice questions will state a question or incomplete statement followed by possible answers. The student will then select the correct answer, or if stated, the best or worst answer. When constructed properly, the multiple choice question is perhaps the

best traditional way of objectively testing students. These types of questions can be used to test knowledge of factual subject matter or the understanding of it. Also, the choices of a student guessing are reduced. Another advantage is that they are easy and fast to score. A wide range of student knowledge can be evaluated.

Multiple choice questions can be constructed to evaluate students' ability to interpret, select, discriminate, and draw conclusions from facts or concepts that they have learned. Teachers can also gain a students' level of understanding, reasoning abilities, and judgment by utilizing multiple choice questions. Thus, they usually are considered to be the most valuable of the traditional type of evaluation when seeking objective information.

Another advantage of using multiple choice questions is their ease of scoring and familiarity. Optical scanning forms can be utilized to make scoring fast and accurate. Also, students have usually experienced multiple choice items during evaluation. Thus, they generally know how to respond and the expectations sought by teachers.

Multiple choice questions' biggest advantage is its ability to assess students on a wide variety of constructs. When constructed properly, such questions can effectively assess students on the following concepts: definition, purpose, cause and effect, association, identification of error, evaluation, differences and similarities, arrangement, common principles, and questions relating to controversial subjects.

There are a few limitations in using multiple choice questions. One disadvantage involves the people constructing such questions. Many teachers may not know how to or take the time it takes to create and develop a good multiple choice question. Many times the creator of such questions misses the point and focuses too much on memorization of

subject matter rather than application. Also, it does take time to effectively create multiple choice questions so the distracters, the wrong choices in a question, are not correct or most desirable without giving away the correct answer. It is difficult and takes skill to construct a multiple choice question so that only one choice is correct or most correct. If space is a concern, it will be a problem to deal with using multiple choice questions. Because of the question itself and the four or five possible choices being listed, much space needs to be used.

Completion or fill in the blank questions

Another traditional method utilized by teachers to evaluate student learning is the completion or fill in the blank question. This type of question consists of a statement with one or more key words missing with blanks left in their place. Students are directed to fill in the blanks to complete the statement or sentence. This type of traditional evaluation method can be used to objectively test a student's ability to recall subject matter. It is a good question to utilize when seeking information about students' knowledge of facts, symbols or words. Students would find it difficult to guess at the correct answer with this type of objective test item. However, skill is needed on the person constructing such a test item that suggest only one right answer.

There are some advantages to using this type of question. When subject matter is such that specific or accurate information is sought from students, this objective test question is relatively easy to construct. However, when constructing such an item, one must remember to design the question where only one such item can be correct. This kind of test question will have a high discriminating value. Students by knowing, or not knowing the correct answer, will show a teacher which students know or don't know the

specific subject matter. This is valuable and accurate information when detailed information is sought. For example, the ability of students to recall arithmetic computations, formulas, or measuring techniques would be very valuable.

There are some disadvantages to be aware of when utilizing completion or fill in the blank questions. There is a tendency by some evaluators to use them too much as they are easy to construct and they give such factual and exact information. Thus, many times memorization of facts, figures, or formulas may be emphasized too much, resulting in lower levels of cognitive learning. One would seek more of a higher order of mastering a subject or content area—not just memorizing constructs. Another draw back is in the construction itself. Scoring can be difficult unless skill and specific detail is utilized in seeking a specific correct answer. Otherwise, two or more possible correct answers may be given by the student which then makes scoring more difficult.

Lastly, with completion or fill in the blank type questions, it is difficult to understand if a complete understanding of the subject matter was attained by a student. Or, were the students good at memorization key constructs of the subject matter? Also, some students may know the subject matter well but have difficulty remembering the exact word or phrase sought in the question. These limitations need to be addressed and weighed by the evaluator as they construct a fair and effective evaluation strategy.

Matching Test Items

Another traditional method to objectively evaluate students is by utilizing matching items. These types of questions would require students to match two sets of material. A common strategy used is to provide two columns of words, phrases, or illustrations. The first column is usually numbered to relate to numbers of the test item,

and a second column is usually lettered. Thus, the learner would seek to match each item in one list with the item in the other list. Recognition in the cognitive domain is sought by the evaluator by using such questions.

As with other traditional methods of assessment, there are some advantages in using this strategy of assessment. The matching item is very useful for evaluating a student's ability to recognize relationships and to discriminate between concepts. It may also help assess a student's knowledge in subject matter by being able to make associations and naming or identifying things learned. Construction of such matching questions are somewhat easy to construct, and can be scored quickly.

Because matching items calls for phrases or words to be short, there are limitations. For example, it may be a poor measure of complete understanding of the subject matter. The matching item is inferior when measuring judgment or application of subject matter. This type of evaluation tool is seeking lower level cognitive knowledge as to what things are or where things fit into the realm of who, what, where or how. Another drawback would suggest that some matching items, if not constructed well, would give subtle clues to the correct answer. Using too many matching items may result in students starting to memorize all the facts of certain subject matter and not using judgment or assessment of given facts.

Essay Questions

In a search to find out the depth of what a student may know of certain subject matter, the essay test does well (Green, 1975). With the objective type questions, evaluators may tend to limit information from the student to only what is asked for. But with subjective type items such as an essay question, it tends to give students the freedom

to express themselves more. The student can relate more to their life experiences and in depth understanding of the subject matter. The essay test item also affords the student to organize their thoughts and systematically communicate in written form.

The advantages of essay questions are many. They can be utilized to measure students' understanding, attitudes, interests, and creativity. In the cognitive domain, higher levels of measures are measured such as application, analysis, synthesis, and evaluation of the subject matter. Essay type questions lend well in classes or teaching styles where creativity or divergent thinking is encouraged. The essay question permits students to take information and synthesize it, evaluate it, and organize their response in written form. Thus, it encourages creativity and permits students to show depth in their understanding of information asked for.

Essay questions generally fall under two types; extended response and restricted response. The extended response is more unstructured. Thus, the student has more freedom to explain his or her response with personal insights or beliefs with their scope and breadth of knowledge. The restricted response essay question would be more specific about what was asked for. For example, one may be asked to discuss two techniques of teaching and detail the principles of each.

Disadvantages of essay questions are with their formation and scoring. Many factors need to be decided before using essay questions. One such factor is determining if the essay question would meet the objectives, and do students have enough skills in composition and knowledge in the subject matter to write an essay question. Also, will there be enough time for students to give their best effort (Green, 1975). To score an essay question fairly among all students, the grading criteria needs to be communicated to

students. Thus, when it comes time to score, the teacher and student will be at ease as to why points were given or deleted. Having time to score essay questions is a disadvantage for teachers. It takes time to read and make consistent and fair judgments of students' responses of essay questions. Lastly, validity among essay questions is considered to be low. With an essay question, is one measuring what they set out to measure? With this type of subjective evaluation technique, validity is often unclear.

Alternative Assessment

Alternative strategies to assess what a student knows, or can do, has many tools to work with. Although traditional methods of evaluation helped teachers evaluate student progress for many years, some of these methods are thought to be misguided. Traditional methods may be a poor diagnostic tool and provide a limited measure of a narrow aspect of learning. Paper and pencil tests are generally poor predictors of how students may perform in other settings (Falk, 2000). Traditional methods do not demonstrate how students tackle challenges or what abilities they rely on to solve problems. Essentially, traditional methods provide little information that can help a student improve. With paper and pencil evaluations, students either pass or fail. Most tests focus on rote learning and ask for recall and recognition of facts instead of demonstration of skills and knowledge in lifelike situations (Falk, 2000). Students in the United States do not do well on higher order thinking and problem solving as do students in European and Asian countries. This is attributed to the fact that other countries routinely utilize work samples, oral examinations and other alternative strategies to assess students' progress.

Authentic Assessments

The case for authentic assessment appears strong. Since the late 1980s, there has been a push for more authentic assessment. Authentic assessment seeks to measure what students can do with what they learn, rather than simply what they can commit to memory (Nickell, 1999). What occurs in most schools is a ritual that lacks substance. Test scores and memorized facts don't mean much (Campbell, 2000). Authentic assessments promote real-world application of the learning (Tileston, 2000). Such assessments would give students the freedom to actually do something with the knowledge they learned other than just choose, pick or match the right answer. Students would be encouraged to take their newly learned knowledge and problem-solve a real-world situation. Or, produce something using organization, process, group and communication skills. Authentic assessment opens up exciting possibilities (Kohn, 1999). There are many authentic assessment strategies or methods available for educators.

Performance Assessment

One such authentic assessment method is the use of performance assessments in the classroom. Performance assessments create situations where students must construct responses that show they can apply what they have learned (Marzano & Kendall, 1996). Using this type of assessment is valuable because it can be used to assess many types of standards and benchmarks such as thinking and reasoning, problem solving, synthesizing information, evaluating, and accomplishing all this under real-world situations.

There is mounting evidence that performance assessment alters what is happening in a classroom. This type of assessment inspires teachers to integrate instructional

practices with assessment practices so they become more seamless (Marzano and Kendall, 1996). It was also found that performance assessment generated more engagement from students and they appear to have a deeper understanding of the content being studied.

Certain assigned performances could be utilized to accomplish this strategy. Students could perform oral reports or demonstrations, dances, dramatic readings, enactments, debates, and recitals to name a few (McTighe & Ferrara, 1997).

A took that lends itself well for using performance assessment is the use of a rubric. Creating a rubric has advantages for the student and the teacher. A rubric helps facilitate a quality performance by making clear the expectations to the student. Sometimes students are unclear as to what is expected of them, and they may be confused as to what is considered to be an excellent, ordinary or bad performance. Research has shown that when students were allowed to self assess their performance when a rubric was utilized, a positive and better performance resulted. And, students were remarkably willing to revise it (Andrade, 1999).

The use of a rubric is also helpful to teachers. It gives guidance in preparing and instructing students. A rubric also facilitates the evaluation process by making the scoring more fair and consistent. And, lastly, it helps parents understand what their son or daughter are being evaluated on and how their grade was assigned (McTighe & Ferrara, 1997).

Portfolios

Another form of authentic assessment is when students are asked to produce a product relating to the subject matter. One such product is a portfolio. Becoming more

popular, a portfolio may be a collection of performance tasks such as written reports, notes from an oral report, examples from various stages of development, selected drafts of a written report, and the like. It may also contain a description of the process that was followed and perhaps why certain decisions were made (Marzano & Kendall, 1996).

Lastly, portfolios would also include exhibitions or presentations of a student's work. Done correctly, a portfolio is a recorded journey of a student's work with examples, reflections, and insight as to how they made decisions and what they have learned. Portfolios have generated excitement among some educators. In North Carolina, they have discontinued two of it required standardized tests and have implemented portfolio assessment strategies in magnet and specialization schools (Freeman, 2003). If properly planned, they can be used to enhance student self-assessment and understanding of the subject matter (Reckase, 1995). However, grading portfolios takes time and caution should be taken to grade them consistently and fairly.

Research reported on the grading of portfolios revealed interesting results. As 147 teachers graded components of a portfolio over a ten week period, bias was found among the teachers as student background, growth, and actual performance influenced teacher evaluations (Anderson, 1999). Thus, grading portfolios is time consuming and difficult because most teachers are close at hand when students create and build their portfolios. The teachers are the most qualified to grade it, but they may also be at a disadvantage, because they are so close to it. The halo effect may creep in and bias may play a part in the quality of the portfolio.

Observation Techniques

Observation is another strategy that can be used by teachers when seeking to use authentic assessments of their students. Observation is an accepted research method for qualitative research, but many teachers may hesitate to use it to measure and report student progress (Nickell & Wilson, 1999). The classroom teacher is in a good position to observe students each day as they perform assignments and/or activities. A well-planned observation should be well planned and tied to expectations communicated clearly in the classroom or lab early on. A teacher would ? to observe students develop skills taught, and the like.

Observation can be effectively used in assessing students' progress in the affective domain. For example, are students following safety rules while performing tasks in a lab without being reminded? This technique provides an opportunity to evaluate learning without taking time from other classroom duties such as formal instruction or demonstration.

It is important to base the observation on objectives of the course and to have clearly in mind exactly what is to be observed. Observations should be recorded on some type of progress or observation chart. A chart would make it clear and consistent as to what would be observed and how it is scored if used for grading purposes. Regular feedback and space for student comment on the observation form should be made available to invite reflections from the students (Nickell & Wilson, 1999).

Student Self Assessment

Having students involved in their own assessment is another strategy of alternatives evaluation. When students take some responsibility for their own work, they

appear to internalize instructional goals and standards and apply them to future efforts (Hart, 1999). Students are generally willing to evaluate and provide feedback to their learning process (Spencer & Schinelkin, 2002). Some students naturally assess their own work, but many students are not given an opportunity to get formally involved in doing so. If this strategy is used in a classroom, the self-assessment habit usually begins as collaborative goal setting with their teacher. The students and teacher would establish instructional goals for the class. When identified, the goals would be clearly communicated, posted in the classroom and referred to often. From time to time, students would be asked to reflect on their progress towards those instructional goals. To help students in this process, self-evaluation forms, check lists, or rubrics can be developed. Self assessment may be essential for progress as a learner (Brookhart, 2001).

Results of a comprehensive meta-analysis of over 40 controlled studies report consistent and sizable gains directly attributable to prior differences in teachers' classroom assessment practices (Stiggins, 1999). How classroom assessment is utilized does seem to have effects, good or bad, on students' overall learning. Students apparently learn better when they are actively involved in their assessment. However, a clear picture of predetermined goals or targets must be internalized by students beforehand. Key to this strategy is inviting students to play a role in defining the criteria by which their work will be judged. Students can then apply those criteria to their work. This helps students realize where they are in the beginning and where a teacher wants them to be. Thus, it creates a classroom where there are no surprises and no excuses. This process builds trust and confidence between the teacher and students (Stiggens,

1999). Perhaps, the more students get involved in self-assessment, increased performance may follow (Balch, 1998).

Allowing students to self assess their work seems to have favorable effects on those students' willingness to learn. Research conducted on students suggests that when given the chance to assess their work using a rubric, were remarkably willing to revise it. Students in the same study, who were not given a rubric or asked to self assess their work, tended to score lower than the other group (Andrade, 1999).

Many teachers appear reluctant to let students be involved in the self assessment of their work. Grant Wiggins, a leading authority on authentic assessment, suggests that the whole point is to facilitate an environment that permits students to be in a self-disciplined, self-regulating, and self-assessing position (Hart, 1999).

Learning and Assessment

In creating effective assessment strategies, how the brain learns should be considered. To look at how the brain learns and then develop assessments from that information is conducive to good assessment. For a student to experience meaningful learning, they need to achieve "relaxed alertness" (Cain & Cain, 1999). To achieve that a teacher needs to create a classroom environment where students experience low threat and high challenge. There will always be a little anxiety in a learning atmosphere, but the idea here is for the teacher to reduce the feeling of helplessness as much as possible for effective learning to take place. To be highly challenged means more than just doing what a teacher says. Rather, it means a situation where a student is personally engaged and chooses challenge over defeat of a given task.

A second inference of how the brain learns best is through curriculum that is genuinely meaningful to a student. And, the information must be embedded in an adequate amount of authentic, complex experience (Cain & Cain, 1999). All talk, chalk, overheads, videos, and drills are important. But, without real world sensory input, some learning opportunities will be lost. Most people can attest that skills or ideas they learned were meaningful, useful, transferable, and in contexts of real world experiences.

Many times assessments don't match what a teacher wants their students to learn. If an assessment is to measure basic facts that can be recited and reproduced on demand, then paper/pencil tests are sufficient. But, if teachers want students to be able to think creatively or to solve problems in an abstract way, then a problem-based test would suffice. Lastly, if teacher expect students to know something and use it dynamically in practical real world performances, then assessments that reflect such performances should be used.

In brief, different assessments should be related to what is to be assessed. In determining what assessment strategy to utilize, three criteria might be considered (McTighe & Ferrare, 1997). One might consider validity, reliability, and feasibility. Validity would seek to answer the question as to whether one is measuring a student's achievement with the particular assessment instrument, whether it was a performance task, a portfolio, multiple choice questions, or a host of others. Reliability would seek to find out whether consistent results could be attributed to an assessment used. Lastly, the feasibility of an assessment relates to whether the assessment can be effectively executed in the classroom with the time frame allowed, and the available equipment and materials in the classroom. Another variable to consider is student's learning styles.

All innovation in assessment will benefit from attention to student's learning style differences. In what has become known as Gardner's multiple intelligences, seven distinct intelligences are proposed (Garger & Guiled, 1998). In 1997, an eighth intelligence was added to make eight proposed intelligences. It is suggested that all people acquire them, but are developed unevenly in people. Those eight proposed intelligences are as follows:

1. Linguistic – there people are good with language and words. They have a strong vocabulary and can communicate in a clear and interesting way.
2. Logical – people with this intelligence are thought to be mathematical. They discern quantitative relationships related to calculations and scientific areas.
3. Spatial – these people can manipulate images and can recognize and create visual forms mentally and on paper.
4. Bodily Kinesthetic – this group of people have graceful body movements and have better than average physical agility. These people usually are good athletes.
5. Musical – people of this sort have sensitivity to sound and have the ability to create music and communicate through tones and rhythmic patterns.
6. Interpersonal – these people understand perspectives of other people well. And, they relate easily and are skilled at working cooperatively with others.
7. Intra Personal – this person reflects on themselves thoughtfully. They are perceptive of personal abilities and are attuned to their personal history.
8. Naturalist – these people are interested in and are knowledgeable of the natural world and they have the ability to discriminate among sensory things around them.

The theory of these multiple intelligences challenges teachers to look at the content they teach and to perhaps broaden aspects of that content (Garger & Guiled, 1998). As students learn in different and distinctive ways, they would be better served if content would be taught in a number of different ways. Furthermore, diversity in ways of learning would demand a variety in ways of assessing learning. With the proposed theory of how people learn differently through multiple intelligences, teachers might intentionally design different ways to assess mastery and competence of subject matter in the classroom.

Chapter III Methods and Procedures

The methods and procedures used in this study of Assessment Practices of Technology Teachers are explained in this chapter under the headings of (1) research design, (2) sample selection, (3) instrumentation, (4) procedures followed, and (5) method of analysis.

Research Design

Review of the literature has suggested many teachers are not effectively using assessment methods to assess classroom learning and many techniques used were poor and inadequate (Mertler, 2000). This study sought answers to the following questions of technology education teachers in Southeastern Wisconsin:

1. What are the traditional forms of assessment in technology education classrooms?
2. What alternative forms of assessments are used in technology education classrooms?
3. How effective do technology education teachers view their assessments?
4. What are the differences among the subjects in the sample related to:

a. a teacher's number of years teaching

b. a teacher's educational level attained

The data from this study gives insight into current traditional and alternative assessment practices among technology education teachers of high schools in Southeastern Wisconsin. The data are used to advance relevant discussion and recommendations concerning use of assessment methods and strategies in technology education classrooms.

This study is a descriptive research design. The purpose is to describe facts and characteristics of a given sample of a population. The data of this study are not to seek cause and effect, relationships, or to make predictions. Rather, this study is a descriptive look at facts and characteristics among educators about their assessment strategies and feelings of their assessment's effectiveness during a specific time frame, that being the Fall of 2003.

In this study, the population was technology education teachers in Southeastern Wisconsin. Thus, the sample of subjects are such teachers from high schools chosen randomly in Southeastern Wisconsin. Measurers of central tendency were sought among the sample of teachers and compared statistically in accordance to the study's research questions.

Statistically, measures of central tendency were calculated with the data. The data is of the nominal scale as the study does not seek to indicate order or rank, intervals, or ratios. The mean and the standard deviation was calculated for each research question sought.

Sample Selection

The population this study sought was technology education teachers at the secondary level in Wisconsin. Because of the large scope this would entail throughout Wisconsin, a sample was chosen by the researcher by randomly choosing secondary schools in Southeastern Wisconsin. Schools from that region were chosen because the researcher teaches within that region and had an interest of the data from that sample. The schools chosen were high schools, grades 9-12, that have technology education curriculum offered to their students. Each of the schools had an equal chance of being chosen for the sample regardless of student population, the number of technology education classes offered, or the number of technology education teachers at each school. These school's names were placed in a box and randomly chosen by the researcher to derive the sample of the study.

Twenty nine high schools were chosen to represent the sample for the study. Among those schools chosen, there were 105 technology education teachers that represent the sample for the study.

Instrumentation

After reviewing the literature, the researcher designed the data collection instrument to focus on two assessment types used by technical educators. The instrument focuses on traditional and alternative forms of assessments used in classrooms (see Appendix A). Among these two basic assessment forms, particular assessment strategies from each are addressed by the instrument.

The review of literature also suggested assessments were not being utilized effectively. Thus, the researcher included a data gathering question related to how

effective each subject felt their assessment strategies were. Using a likert type scale, subjects were given four choices to chose from relating to their assessment's effectiveness.

Lastly, two responses were created on the instrument concerning variables of the subject's years as a teacher and the level of education attained. The researcher's rational was that of obtaining a descriptive view of mean scores among subjects in the sample pertaining to the last research question.

The instrument was pilot tested for clarity, understanding, and relevance by other technology education teachers in the Northern and Western part of the state whom the researcher knew would not be part of the sample. Dr. Howard Lee, the researcher's advisor for the study, also gave relevant insight and feedback on the instrument's development and validity. Subsequent revisions were then made to the instrument accordingly.

The instrument was utilized in the data collection process by mailing each subject in the sample at their school's address. Subject's addresses were gathered by calling their respective schools. After explaining the purpose of gathering the information and the nature of the proposed study, permission to mail the research instrument to each subject was obtained.

Procedures Followed

The topic of this study was identified, investigated, discussed with and approved by the researcher's research advisor. Next, a review of literature was conducted to acquaint the researcher with current information and research that had been conducted in the past. Upon completion of the review of literature, objectives of the study were

developed and hence, the statement of the problem was formed. The objectives were further developed into research questions to be answered by the study. Lastly, the purpose of the study was formulated to clearly communicate the study's vision.

After approval of chapter I, an extensive review of the literature was conducted to attain insight, opinions, and relevant research related to the study's statement of the problem and purpose. After completion and approval of chapter II of the study, the methods by which the study would be conducted were discussed and planned with the researcher's research advisor.

Before starting chapter III, the researcher went on – line and completed the UW-Stout Human Subjects Training Certification which is required. The information was useful in planning how to correctly, legally, and ethically gather data from the study's subjects. Before proceeding with the study, the Protection of Human Subjects in Research Form was completed on – line. The required information and signatures were obtained and given to Stout Solutions – Research Services for review and approval. Upon notification, the data gathering instrument could begin to be created and eventually used to collect the data.

Paying close attention to the study's statement of the problem and the research questions to be answered, the data gathering instrument was produced. Feedback was sought from the researcher's research advisor as to appropriateness and validity of the instrument. A pilot study was conducted on subjects who were known by the researcher from other parts of the state and not to be part of the sample of subjects. After the pilot study and advisement was completed, the instrument could be used to gather data.

The population for this study was technology education teachers in Southeastern Wisconsin. The sample population was then chosen randomly by picking names of secondary high schools from that part of the state out of a box by the researcher. By mailing the subjects, the researcher thought it would be the most timely way to gather the data. Research instruments were then mailed to each subject. A cover letter explaining the purpose of the research was sent with the instrument (See Appendix B). When the research instruments were returned to the researcher, the instrument was utilized and marked according to each subject's responses. If no response was received by subjects after two weeks, the researcher sent a follow up letter to encourage the subjects to respond. After that, attempts to contact remaining subjects were terminated.

Method of Analysis

Upon completion of the data gathering, the data was analyzed to answer the research questions and purpose of the study. The raw data of each of the subject's responses were described in terms of mean responses. This statistic was utilized because the study is of a descriptive nature. Thus, its purpose was to describe facts and characteristics of a sample population at a point in time.

The data was statistically analyzed for each of the responses of the instrument by calculating the mean and standard deviation score for each response. By obtaining the mean response the researcher attained statistical information as to what assessment strategies of the traditional and alternative nature are being used by the sample of subjects. Furthermore, the study was able to gain insight as to how effective subjects felt their assessment strategies were. Lastly, by obtaining the mean responses, the descriptive

study was able to statistically view the number of years experience the subjects have with teaching and the level of education attained.

Chapter IV Analysis of Data

In this chapter the research questions sought through this descriptive research study will be presented in terms of the data acquired through the survey questionnaire. The results will be presented through the use of narrative and tables.

This study is a descriptive research design. The purpose is to describe facts and characteristics of a given sample of a population. Furthermore, the purpose of this study was to determine data and characteristics among technology education teachers in Southeastern Wisconsin high schools about their assessment strategies and feelings of their assessment's effectiveness.

Measurers of central tendency were used to analyze the data from the sample of teachers and compared statistically in accordance to the study's research questions. The data is of the nominal scale. One hundred and two data gathering instruments were sent to subjects in the study and 52 were completed and returned which made the response rate slightly over 50%. Each research question will now be restated and answered.

Research Question One

What are the traditional forms of assessment in technology education classrooms? The purpose of this research question was to find out what forms of traditional assessments teachers from the study's sample were using. The subjects were asked to rate how much they used each of the traditional forms of assessments identified in the study by circling one of four choices: never used; used sometimes; used frequently; or used most of the time. By creating tables showing the frequencies and percentages of

responses for each choice and statistically calculating the mean and standard deviation scores, the research findings can be easily read and communicated effectively.

For research question one, Tables 1 – 5 indicate the data regarding usage of traditional items used by the sample. Each of the responses are weighted using the following format to compare frequencies, percentages, means, and standard deviations:

(4) represents Used Most of Time

(3) represents Used Frequently

(2) represents Used Sometimes

(1) represents Never Used

As shown in Table 1, Responses to True and False Questions, the responses have been noted for how often the subjects use true and false type questions in their assessments. Subjects were asked to indicate how often they used true and false questions.

Table 1

Responses to True and False Questions

Choice		Frequency	%	Mean	SD
Used Most of Time	(4)	0	0		
Used Frequently	(3)	11	21.2		
Used Sometimes	(2)	25	48.1	1.9	.71
Never Used	(1)	16	30.7		
	Total	52	100%		

Under the true or false question option, the most chosen response was used - sometimes with 25 of the 52 subjects responding to that choice. Almost 50% indicated

they use true and false questions on a sometimes basis. The mean is 1.90 and the standard deviation at .71. Slightly over 30% indicated they never use this type of assessment question while only 21% said they used this type of question frequently. Overall a mean of 1.9 is close to used - sometimes indicating that true and false questions may not be that popular of an item. With a standard deviation of .71 there seems to be good agreement among the subjects.

As shown in Table 2, Responses to Multiple Choice Questions, the multiple choice question is used more frequently according to a response of almost 80%. The mean for how often multiple questions are used is 2.98 and the standard deviation is .46.

Table 2

Responses to Multiple Choice Questions

Choice		Frequency	%	Mean	SD
Used Most of Time	(4)	5	9.6		
Used Frequently	(3)	41	78.9	2.98	.46
Used Sometimes	(2)	6	11.5		
Never Used	(1)	0	0		
	Total	52	100%		

No subjects in the sample indicated they never used this type of assessment question. Almost 12% indicated they used multiple choice questions sometimes while almost 10% indicated they used it most of the time. With the overall mean of 2.98, it is very close to the category of being used - frequently by the subjects. Thus, this item appears to be a popular method to assess students among this sample.

As shown in Table 3, Responses to Completion or Fill in the Blank Questions, the completion or fill in the blank type question is used frequently by this sample of teachers surveyed. Fifty-four percent indicated they used completion or fill in the blank questions frequently and slightly over 42% indicated they use it sometimes.

Table 3

Responses to Completion or Fill in the Blank Questions

Choices		Frequency	%	Mean	SD
Used Most of Time	(4)	2	3.9		
Used Frequently	(3)	28	53.8	2.62	.62
Used Sometimes	(2)	22	42.3		
Never Used	(1)	0	0		
	Total	52	100%		

The mean for this category is 2.62 and the standard deviation is .62. All subjects indicated that completion or fill in the blank items are used as no one in the sample selected never - used. Overall a mean of 2.62 is closest to used – frequently indicating that completion or fill in the blank items are popular among this sample. With a standard deviation of .62 there seems to be agreement.

As Table 4 indicates, Responses to Matching Questions, the matching items were found to be used frequently over 55% of the time by this sample of teachers. Of the 52 responses, 50 indicted they used matching items either sometimes or frequently reflected by the mean of 2.52.

The mean falls between used - sometimes and used - frequently indicating that matching items are popular among subjects of this sample. The standard deviation of .57 suggests there is general agreement among this sample.

Table 4

Responses to Matching Questions

Choices		Frequency	%	Mean	SD
Used Most of Time	(4)	0	0		
Used Frequently	(3)	29	55.7	2.52	.57
Used Sometimes	(2)	21	40.4		
Never Used	(1)	2	3.9		
	Total	52	100%		

Table 5 shows, Reponses to Essay Questions, the results of how often essay items are used by this sample. Essay items were used only sometimes by over 63% of this sample. Overall a mean of 1.83 is somewhat close to used - sometimes indicating that essay items may not be a popular item.

Table 5

Responses to Essay Questions

Choices		Frequency	%	Mean	SD
Used Most of Time	(4)	0	0		
Used Frequently	(3)	5	9.6		
Used Sometimes	(2)	33	63.5	1.83	.58
Never Used	(1)	14	26.9		
	Total	52	100%		

With a standard deviation of .58 there seems to be somewhat of an agreement among the sample. Almost 27% of the subjects indicated they never - used this form of assessment. Of the 52 respondents, 5 indicated they used it frequently indicating not many subjects among this sample use the essay item frequently. Perhaps subjects of this sample don't use essay items because they are time consuming to grade and responses are of a subjective nature.

Summary of Research Question One

Among the five items to respond to among the sample, multiple choice items are used the most by this sample. The mean of 2.98 is the highest mean of the five item choices indicating that this item is very popular. Although good multiple choice items take time to construct effectively, once reliability is achieved it offers teachers an effective assessment tool.

The completion item was found to be the next most popular assessment tool among this sample indicating its popularity by generating a mean of 2.62. Objectively, completion or fill in the blank items offers teachers good feedback as to whether students know the course content. Seen as a popular item among this sample, subjects may view this assessment tool as an effective method in making judgments about student learning.

Matching items appear to be a somewhat popular item used by this sample too but not as popular as multiple choice and completion or fill in the blank. With an overall mean of 2.52, the matching item is used a lot among this sample. The mean falls about half way between used – sometimes and used – frequently indicating the items strong usage. Matching items may be popular among these subjects because it offers an objective tool for gathering information from students about course content or systems.

Matching items are relatively easy to construct and grade which may also add to it popularity.

True and false items are not used nearly as much by this sample. With an overall mean of 1.9 it suggests this item is not used much. Over 30% of this sample indicated they never – used this item also indicating the item's unpopularity. Perhaps subjects don't like true and false items because it gives a student a 50% chance of getting the right answer just by guessing. The true and false item can sometimes be hard to construct without stating subtle hints about the answer. This may be another reason why this sample indicated they don't use this item as much.

With an overall mean of 1.83, the essay item gave the lowest indication of use among this sample. Although 5 of the 52 subjects indicated they used this item frequently, the majority, 47 out of 52, indicated they never – use or only used it sometimes. The essay item can be subjective in nature to grade effectively if not constructed properly. But perhaps the big factor among responses may be the extra time needed in reading through each item and deciding on the student's effective response.

Research Question Two

What alternative forms of assessments are used in technology education classrooms? This research sought data as to what types of alternative assessments the sample of teachers in this study used in their classrooms. For research question two, Tables 6 – 9 indicate the data regarding usage of alternative forms of assessments used by this sample. Each of the responses are weighted to compare the frequency, percentage, mean, and standard deviation. using the following format:

(4) Used Most of Time

(3) Used Frequently

(2) Used Sometimes

(1) Never Used

Performance assessments are used to make judgments about a student's performance in class. Usually an assigned task is involved where the student would perform a task after seeing a demonstration on how to perform the task and an opportunity to practice the task before being assessed. Teachers often use a rubric or checklist with criteria in assessing the student's performance and completion of the task.

Table 6, Responses to Performance Assessments, gives the results of the choices the subjects chose of how often performance assessments are used in their classroom.

Table 6

Responses to Performance Assessments

Choices		Frequency	%	Mean	SD
Used Most of Time	(4)	31	59.6	3.65	.54
Used Frequently	(3)	20	38.5		
Used Sometimes	(2)	1	1.9		
Never Used	(1)	0	0		
	Total	52	100%		

Performance assessments are used most of the time by almost 60% of respondents as shown in Table 6. Almost 39% of respondents indicated performance assessments were used frequently. The mean for this assessment technique is 3.65 and the standard deviation is .54. All respondents indicated they used this form of assessment tool as no

respondent indicated they never used it in their classrooms. Overall a mean of 3.65 is pretty close to used - most of the time indicating that performance assessments are popular among this sample. Performance assessments may be used a lot because they fit well in assessing what students do in technology education classrooms. Students use cognitive knowledge and psychomotor skills to perform tasks. Performance assessments provide an effective assessment tool for viewing a student's efforts and may be popular for that reason.

As shown in Table 7, Responses to Portfolios, portfolios were not used much by this sample of teachers.

Almost 70% indicated they never used this tool as part of their assessment strategy.

Table 7

Responses to Portfolios

Choice		Frequency	%	Mean	SD
Used Most of Time	(4)	0	0		
Used Frequently	(3)	2	3.8		
Used Sometime	(2)	14	27		
Never Used	(1)	36	69.2	1.35	.56
	Total	52	100%		

The mean was 1.35 among the choices and the standard deviation is .56. Overall a mean of 1.35 is low indicating that portfolios may not be a popular item. However, some subjects are using portfolios because 14% indicated they use portfolios sometimes but only 2 out of 52 responses indicated they used portfolios frequently . The question is why portfolios are not used more frequently? It may be that portfolios don't fit well for

what is taught in many classrooms and grading portfolios can be subjective. These considerations may be why portfolios are not used more frequently.

In technology education classrooms, students usually are doing things as they learn. They may build, plan, fix, or trouble shoot in order to complete an assigned task. Thus, a teacher may use observation techniques to gain information as to student's learning processes. Teachers may have certain behaviors they are observing or some other criteria they apply and weigh in their observation techniques.

As Table 8, Responses to Observation Techniques indicates, observation techniques are used by this sample of teachers over 61% of the time in their classrooms. Almost 37% indicated observation techniques are used frequently to assess students in these classrooms.

Table 8

Responses to Observation Techniques

Choice		Frequency	%	Mean	SD
Used Most of Time	(4)	32	61.5	3.6	.53
Used Frequently	(3)	19	36.6		
Used Sometimes	(2)	1	1.9		
Never Used	(1)	0	0		
	Total	52	100%		

The mean for this category is 3.6 and the standard deviation is .53. Overall a mean of 3.6 indicates that observation techniques are used a lot by subjects in this sample. With a standard deviation of .53 there appears to be some agreement among the

sample. This assessment technique is very popular among this sample as no respondent indicated they never - used this assessment strategy with their students.

Some teachers let students self-assess their assigned work or tasks. Usually a rubric or checklist is used for the student to compare their work to some agreed upon criteria. It gives students standards to shoot for and information to judge their own work. Students usually can identify their weaknesses and strengths and take action to improve their learning.

As Table 9 indicates, Responses to Student Self Assessments, student self-assessment is used frequently by over 57% of the respondents. About half that amount, 27% of the respondents, indicated they use student self assessments sometimes in their classroom.

Table 9

Responses to Student Self Assessments

Choice		Frequency	%	Mean	SD
Used Most of Time	(4)	0	0		
Used Frequently	(3)	30	57.6	2.42	.74
Used Sometimes	(2)	14	27		
Never Used	(1)	8	15.4		
	Total	52	100%		

The mean for how often this choice is used is 2.42 and the standard deviation is .74. Overall a mean of 2.42 is about half way between used - sometimes and used - frequently indicating somewhat strong use as an assessment tool among respondents. With a standard deviation of .74 there seems to be very good agreement by the

respondents. Over 15% indicated they never use this form of assessment while no respondent indicated they used it most of the time.

The real question is why student self-assessments are not used by over 15% of this sample? Perhaps the eight respondents making up 15.40% of this sample who said they never used this technique teach content that doesn't lend itself well to using student self assessment techniques.

Research Question Three

How effective do technology education teachers view their assessments? As indicated in Table 10, Responses to Assessment Usefulness, respondents were given four choices with which to rate how useful they feel their assessments are. Table 10 has the responses weighted so comparisons between frequency, percentages, mean, and the standard deviation can clearly be communicated.

Table 10

Responses to Assessment Usefulness

Choice		Frequency		%	Mean	SD
How useful are your assessments	Very Useful	(4)	8	15.4		
	Useful	(3)	29	55.8	2.86	.65
	Somewhat Useful	(2)	15	28.8		
	Not Very Useful	(1)	0	0		
		Total	52	100%		

Most respondents from this sample felt their assessments are useful as almost 56% responded to that option. The mean as to how useful assessments are is 2.86 among

the respondents . The standard deviation is .65. Overall a mean of 2.86 is pretty close to useful indicating that most respondents felt their assessments were useful. With a standard deviation of .65 there seems to be good agreement. About half that amount, over 28%, felt their assessments are somewhat useful. Over 15% of the respondents feel their assessments are very useful. However, almost one third, 15 out of 52, indicated their assessments where only somewhat useful. That becomes the real question, why do they feel that way? It may suggest that some respondents are not completely satisfied with their assessment strategies.

Research Question Four

What are the differences among the subjects in the sample related to:

a. a teacher's number of years teaching

b. a teacher's educational level attained

By use of the research data gathering instrument, research question four sought data about respondent's number of years teaching and the educational level they have attained. The four choices for how many years the subjects have been teaching were weighed using the following format:

(4) 13 Years or More

(3) 9 – 12 Years

(2) 5 – 8 Years

(1) 1 – 4 Years

As indicated in Table 11, How Many years the Subjects Have Been Teaching, most respondents, over 55%, have been teaching for over 13 years. Those respondents teaching between 9 – 12 years make up almost 29% of the sample. Only four of 52

respondents indicated they had been teaching between 5 and 8 years and the same amount had been teaching just 1 – 4 years.

Table 11

How Many Years the Subjects Have Been Teaching

Choice		Frequency		%	Mean	SD
How many years they have taught	13 Years or More	(4)	29	55.8		
	9 – 12 Years	(3)	15	28.8	3.33	.92
	5 – 8 Years	(2)	4	7.7		
	1 – 4 Years	(1)	4	7.7		
		Total	52	100%		

The mean of how long the respondents have been teaching is 3.3 among respondents. The standard deviation is .92. Overall a mean of 3.33 is beyond teaching 12 years indicating that most respondents have solid experience as technology education teachers. Eight of the 52 respondents indicated they had taught between 1 and 8 years suggesting not many new licensed teachers have entered the teaching field from this sample.

The second part of this research question is shown in table 12. This question on the survey sought respondent's answers as to the educational level or degrees the subjects have attained. As with the other Tables, the responses have been weighted using the following format so data can be clearly compared:

(1) B.S.

(2) M.S.

(3) M.S. + Credits

(4) Emergency License

As Table 12 indicates, Responses to Educational Degrees Attained, the majority of the respondents have attained a M.S. degree plus some credits.

Table 12

Responses to Educational Degrees Attained

Choice			Frequency	%	Mean	SD
Educational Degree they Attained	B.S.	(1)	8	15.4		
	M.S.	(2)	18	34.5	2.42	.84
	M.S. + Credits	(3)	22	42.3		
	Emergency License	(4)	4	7.7		
		Total	52	100%		

Over 42% responded to attaining a masters degree plus some credits. The mean as to educational degrees attained among respondents is 2.42. The standard deviation is .84. Overall a mean of 2.42 is between a masters degree and having credits beyond a masters degree indicating that most respondents are well educated. Eight of the 52 respondents are teaching with a bachelors degree indicating some new teachers among the sample. Some school districts have had problems finding technology education teachers and that is indicated by the 4 respondents who are teaching under an emergency teacher's license. Those teachers who responded to this study who are teaching under an emergency license make up over 7% of this sample.

The data from this study indicates there are many teachers who possess years of educational experience and have gone on to attain a masters degree. As the data

indicated, over 42% have credits even beyond a masters degree. The data was not analyzed by years of experience or educational degrees attained.

Chapter V

Summary, Conclusions and Recommendations

This chapter is divided into three sections: (1) a summary of this descriptive study; (2) conclusions based on the results of this study; and (3) recommendations related to this study.

Summary

The summary will cover the statement of the problem, research questions, methods and procedures of carrying out the study, and the major findings of the study.

Restatement of the problem.

Review of the literature from this study has suggested many teachers are not effectively using assessment methods to assess classroom learning and many techniques used were poor and inadequate (Mertler, 2000). No research has been specifically been conducted to determine what methods and strategies technology education teachers in Wisconsin are using to assess classroom learning. This study sought answers to the following research questions from technology education teachers in Southeastern Wisconsin high schools:

1. What are the traditional forms of assessment in technology education classrooms?
2. What alternative forms of assessments are used in technology education classrooms?

3. How effective do technology education teachers view their assessments?
4. What are the differences among the subjects in the sample related to:
    a. a teacher's number of years teaching
    b. a teacher's educational level attained

The data gleamed from this descriptive study provides insight into current traditional and alternative assessment practices among technology education teachers of high schools in Southeastern Wisconsin. The data are used to advance relevant discussion and recommendations concerning the effective use of assessment methods and strategies in technology education classrooms.

Methods and Procedures

The topic of this study was identified and discussed with and approved by the researcher's research advisor. After a review of literature, the statement of the problem and objectives of the study were developed. The objectives were developed into research questions as stated above.

This study was a descriptive research design. The purpose was to describe facts and characteristics of a given sample of a population. The population of this study was technology education teachers at the secondary level in Wisconsin. A sample was chosen by the researcher by randomly selecting secondary schools in Southeastern Wisconsin. Twenty-nine schools were chosen that have technology education curriculum offered to students. Each of the schools had an equal chance of being chosen for the sample regardless of student population or technology education classes offered, the number of technology education teachers at each school. The high school's names were placed in a box and randomly chosen by the researcher to derive the sample of the study. Twenty

nine high schools were chosen to represent the sample for the study. Of the schools chosen, there were 105 technology education teachers that represented the sample of the study. Thus, there was an average of about three technology education teachers at each school.

Before starting Chapter III, the researcher went on – line and completed the UW-Stout Human Subjects Training Certification which is required. The required information and signatures were then obtained and given to Stout Solutions – Research Services for review and approval.

After the data gathering instrument was created (Appendix C), the researcher pilot tested the questionnaire with technology education teachers who wouldn't be in the sample to gain feedback as to the instrument's function and effectiveness. Appropriate changes when then made to the questionnaire. Research instruments were then mailed to each subject in the sample along with a cover letter, as found in Appendix D, communicating the purpose and function of the research. The total sample consisted of 102 subjects. Research questionnaires were mailed to all subjects. If no response was received by the subjects after two weeks, the researcher sent a follow up letter to encourage the subjects to respond. After that, attempts to contact remaining subjects were terminated. Fifty-two questionnaires were returned out of 102 which gave a return rate of a little over 50%.

After all data had been tabulated, the researcher analyzed the data to answer the research questions and purpose of the study. The data was analyzed to describe the sample's responses by finding measures of central tendency of each research question.

Thus, the mean and standard deviation was statistically calculated from the technology education teachers that responded.

Major findings

Research question one sought answers to the kinds of traditional forms of assessment subjects from this sample were using in their classrooms. The frequency, percentage, mean, and standard deviation was calculated for each traditional form of assessment on the data gathering instrument.

Multiple choice questions were found to be used frequently by almost 79% of this sample. Out of 52 respondents, 41 indicated they used the multiple choice item frequently. The mean of 2.98 falls very close to the used frequently category which strongly supports the findings. Only six of the 52 respondents indicated they used this item sometimes and only five indicated they use it most of the time. The data suggests that the multiple choice item is a popular form of assessment tool used by this sample. The multiple choice item may be popular among technology education teachers because of its ease of scoring. Once a multiple choice question has been created and adjusted to where its reliability is acceptable, many teachers may find it a quick and reliable assessment tool to assess classroom learning.

The completion or fill in the blank type question is used frequently over 53% of the time by this sample. Twenty–eight out of 52 respondents indicated they used this item frequently making it a very popular assessment tool among this sample. Adding to its popularity is the data of over 42% indicating they used this item sometimes. Out of 52 responses, 50 indicated they used this item either sometimes or frequently. The mean was 2.62 which lays almost in the used – frequently category. No respondent among this

sample indicated they never use this item. With the standard deviation being .62, there is support among this sample of its popularity.

The matching assessment item is very widely used among this sample and may be so because of its ability to objectively assess student learning. Unlike true and false items where students could correctly guess answers, this item clearly revels whether students know the correct responses.

The traditional matching item is used over 55% of the time by this sample. Twenty-nine respondents out of 52 indicated using this assessment item frequently and 21 subjects indicated they used they used this item sometimes. The mean is 2.52 and that lays between used-sometimes and used-frequently making this item a popular item among this sample. This standard deviation is .57 which would give some support to the findings. Only two out of 52 respondents indicated they never use this assessment method.

Many times in technology education classrooms, students are learning about systems and parts related to the whole. Thus, its strong usage among this sample may suggest that these teachers feel this item is a good objective way to help assess whether student learning is being accomplished.

True and false questions were found to be used sometimes by over 48% of this sample while over 30% responded to never using this type of assessment question. Out of 52 respondents, 25 indicated they used true and false items and 16 never use this item. The data supports the finding as a mean of 1.9 falls close to being used only sometimes by this sample. With the standard deviation being .71, there appears there is strong agreement among the respondents. Although 11 of the respondents indicated using this

item frequently, no subjects indicated that they used this item most of the time. The data may indicate that true and false items are not a popular assessment among this sample.

Essay questions tend to be subjective in nature. This assessment item gives students more freedom to express themselves through writing or drawing. The item may have two drawbacks that may reflect its unpopularity among this sample of teachers. The item needs to be constructed clearly so the student understands exactly what is being asked and how to respond. And secondly, it takes more time to effectively correct and grade an essay question. The development and proper usage of essay questions is a skill teachers need to learn and experience. The Department of Public Instruction is requiring its usage with the new PI34 implementation.

Over 26% said the essay question is never used by this sample. Out of 52 respondents, 14 indicated they never use this item. However, over 63% said they used it sometimes in their assessment strategies. The mean for this assessment item is 1.38 and therefor falls between never-used and used-sometimes. Thus, this item is not a real popular item among this sample. The standard deviation is .58 which implies some support for the findings. Only five respondents out of 52 indicated they used this item frequently and no respondent among the sample indicated using it most of the time.

Research question two

Research question two sought what alternative forms of assessments the technology educators in this sample used. Out of 52 respondents, 31 indicated they used performance assessments most of the time. That is reflected in the mean for this item which is 3.65. That falls well into the category of used-most-of-time as almost 60% indicated they use this item that much. Coupled with the data that 20 out of 52

respondents indicated they use this item frequently, this item among this sample is very popular. There was only one respondent who indicated they used this item sometimes.

This item may be popular because of the nature of what students do or perform in technology education classrooms. Many times students are shown demonstrations on how to perform operations or tasks to complete projects. Thus, performance assessments may appear to be a very logical method to assess student's progress. Usually rubrics or checklists are used in assessing a student's learning and progress in completing assigned tasks or projects.

Portfolios were not found to be a popular assessment method among the respondents of this study. Thirty-six out of 52 respondents indicated they never use portfolios as a means of assessing their students. Only 27%, 14 out of 52 indicated they used portfolios sometimes. The mean for this response is 1.35 which falls just above the never-used category and supports the high percentage of non usage among respondents. The standard deviation was .56 which suggests some support from the sample.

Portfolios low usage among this sample might be explained by the nature of what's taught and done in most technology education classrooms. Many times portfolios don't lend themselves well to tasks performed in technology labs. There are a few settings where portfolios might thrive in technology education like printing, photography and others. Perhaps that is reflected in this study's data as 27% indicated they use portfolios sometimes and two respondents indicated they used it frequently. However, most of the time portfolios are not used in technology education classrooms of this sample.

Observation techniques by this sample said they used this strategy over 61% of the time while almost 37% responded to using it frequently. Out of 52 responses, 32 indicated they used this method most of the time and 19 indicated they used the method frequently which is reflected in the high percentage of usage. Obviously, observation techniques is a popular method of assessing students among this sample. The mean is 3.6 which is close to the category of used-most-of-the-time. The standard deviation score among subjects using observation techniques is .53 suggesting some agreement among the sample.

Observation techniques popularity among this sample may be due to its compatibility to many technology education classes. Generally, students in technology education classrooms don't sit very long in desks. Students build, fix, trouble shoot problems or perform assigned tasks. Thus, observation techniques lend well to assessing students while in an active mode of doing something.

According to the data, student self-assessments are used by many teachers of this sample. Thirty out of 52 respondents indicated they use student self-assessments frequently and 14 other respondents indicated they used this method sometimes. The mean of this assessment method is 2.42 which falls between being used sometimes and used frequently. Only eight of the 52 respondents indicated they never used student self-assessments which accounted for 15.4% of the sample. With a standard deviation of .74, there seems to be good agreement.

Student self assessments may be popular among technology education teachers because they might view it as an effective way in getting the student involved in their learning process. By using self assessment methods, students usually know beforehand

the expectations. Thus, they recognize what they need to do and perhaps are more willing to meet them when they are clearly communicated early. This assessment method may be popular because it compliments learning opportunities in technology education classrooms and labs.

Research question three

Research question three sought how effective this sample perceived their assessments. Twenty-nine out of 52 respondents indicated they thought their assessment methods were useful which accounts for 55.8% of the sample. Eight respondents indicated their assessments as being very useful. The mean among the respondents is 2.86 which falls close to the useful category which the frequency and percentage supports. There is some agreement among the sample with a standard deviation of .65. However, 15 of the 52 respondents, 28.8%, indicated their assessments as being only somewhat useful. It is interesting to note that almost one-third of the respondents of this sample indicated that their assessment methods are only somewhat useful. Maybe this statistic relates to the information found while reviewing the literature. It was suggested that many teacher's assessment methods were poor and inadequate (Mertler, 2000).

Research question four

Research question four sought to find how many years teachers in this sample have been teaching and the educational level they had attained . Well over half of this sample have taught for 13 or more years as a technology education teacher. Twenty-nine out of 52 respondents indicated they had taught that length of time accounting for 55.8% of the sample. Fifteen out of 52 respondents have been teaching between 9 – 12 years

making that category the second largest representation of this sample. The mean is 3.33 and that supports the data from the frequency and percentages. Thus, most teachers from the sample have been teaching many years.

The other two categories are split as to the number of years these teachers have been teaching. Four teachers from this sample have been teaching between 5 – 8 years and the same amount, four, have been teaching only 1 – 4 years. There are many technology education teachers who are approaching retirement age or will be approaching that time and that may be reflected by the data related to research question four from this sample.

The other part of research question four sought to find out educational degrees attained by subjects in the sample. Most of this sample, over 42%, said they have attained a masters degree and some credits beyond that. Twenty-two out of the 42 respondents indicated so. Not too far behind those respondents were respondents who indicated they have a masters degree. Eighteen out of 42 respondents, 34.5%, indicated so. The mean among this sample concerning educational degrees attained is 2.86 which suggests that most teachers in this sample have a masters degree with credits beyond that.

Eight of the respondents indicated they are teaching with a bachelors degree suggesting that perhaps they had not been teaching beyond 13 years. Those teaching under an emergency license make up over 7% of this sample as four of the respondents indicated they are teaching under such an arrangement. Some school districts have experienced difficulty in hiring licensed technology education teachers after such teachers had took other positions or retired. Perhaps that situation is reflected in the data from this sample as 7% are presently teaching with an emergency license.

Conclusions

Of the traditional assessments used by the sample of the study, the following conclusions can be drawn from the data. Among the traditional assessment methods used by this sample, the multiple choice question format appears to be used most on a consistent basis. The completion and matching type questions are used frequently well over 50% of the time but not as much as the multiple choice format.

Almost one third of this sample never use the true and false question format. Most of this sample do not even use it half the time. Only 11 teachers of this sample responded to using this type of question frequently.

Many of the teachers in this sample use the essay type question. Over 63% said they use it sometimes but well over 25% never use it. Not surprisingly, none of the teachers in this sample said they used the essay question most of the time and not even 10% said they use it frequently. The use of essay questions among this sample appears to be mixed. Many indicated they use this assessment method sometimes but overall there is not strong usage on a regular basis. It may be that essay questions may not lend itself to course content or how a course it taught. In some technology education classes where some theory may be taught for some time it may be used to assess student's knowledge or understanding. However, in some classes having a student perform a task instead of writing about it may seem like a better method to assess students.

Among the alternative assessments used by this sample of technology education teachers, observation techniques are used most of the time. About 98% of this sample use observation techniques frequently or most of the time in their assessment strategy. This may be so because many technology education classes have students performing

tasks or completing projects. Thus, observation techniques are a good method to assess student's as they go through the tasks in completing projects.

Performance assessments are also used by many of the teachers in this sample. Again, about 98% responded to using this type of assessment frequently or most of the time. It can be concluded from the data that many teachers in the sample utilize observation techniques and performance assessments in their classroom. Again, by the very nature of how many technology education classes are taught and managed, performance assessments appear to be an effective way to assess students in what they do.

Portfolios were not found to be used very much according to the data as almost 70% said they never use this format of assessment. In fact, only two of the subjects from this sample said they used portfolios frequently. Only about 25% said they used this assessment format which is somewhat expected as portfolios are cumbersome to grade effectively and don't fit well among some technology education classes.

According to the data, student self-assessments are used by many teachers of this sample. None of the subjects reported to using it most of the time but well over half said they used it frequently and about half that amount reported using it sometimes. Thus, student self assessment techniques are used by many teachers as an assessment tool from this sample. Perhaps technology education teachers like this method to help assess what students do and how they perform because it gives direct feedback to the student and students have a hand in determining their grade. With student self-assessments, usually a rubric or checklist is communicated early to students on how a project or task is to be

completed. Thus, a student knows what to shoot for and has a role in awarding their grade for a project.

Most of the subjects from this sample viewed their assessments as useful. However, only about 15% thought their assessments were very useful. Surprisingly, almost 29% viewed their assessments as somewhat useful. To have almost one third of the subjects in this sample state they viewed their assessments as only somewhat useful suggests many of these teachers may not be satisfied with their assessment strategies. Perhaps these teachers do not spend enough time redeveloping their assessment methods and strategies as they feel they should. Teachers may feel rushed and believe they don't have the time to rethink their assessment methods and fall in a rut of using the same assessment methods for long periods of time. Guilt may set in and teachers may begin to wonder if their assessment methods are working and if there is a better way to assess students.

Most of the subjects in this sample have been teaching over nine years and beyond 13 years as technology education teachers. That group makes up almost 85% of the sample. With that large of a group within this sample, it may have been suspected that not many are using the essay item because essay items have not been popular among technology education teachers. It could be that they have not been trained how to effectively write them or assess them. However, there have been some new teachers entering the technology education arena as about 14% have been teaching only between one and eight years. These new teachers may have accounted for the nine percent who indicated they use them frequently.

As to educational degrees attained in this sample of technology education teachers, most have attained a masters degree plus some credits. This is not surprising as most subjects in this sample have been teaching well beyond 13 years. Almost as many subjects in this sample have attained a masters degree. Thus, many teachers sampled have attained education beyond a bachelor's degree. A shortage of licensed technology education teachers in Wisconsin is noticed in this sample as four subjects said they were teaching under an emergency license from the Department of Public Instruction.

Recommendations

This descriptive research study sought data as to what assessment methods are used by technology education teachers and their years of experience and education attained. The following recommendations are two-fold. There are recommendations related to this specific study and recommendations for further study.

Recommendations Related to This Study

The literature review of this study suggests that many teachers are not using assessment strategies to their fullest potential. Furthermore, many teacher's assessment strategies are not well planned and many techniques used are poor and inadequate (Mertler, 2000). Few teachers are prepared to face the challenges of developing effective assessments because they haven't been given opportunities to learn to do so. Furthermore, many educational systems fail to provide assessment literacy required to effectively create and maintain assessment strategies to help the learning process (Stiggins, 2002).

It should be noted that recommendations to this study are only generalized to the sample of this study. The data and analysis are not representative of all technology education teachers in Wisconsin. Recommendations are as follows:

1. The literature review of this study revealed that the curriculum of many universities preparing new teachers don't offer many opportunities in learning and exploring new ways in creating effective assessments. Universities preparing teachers should explore and add to their curriculum opportunities and experiences that would expose students to assessment strategies being researched.
2. The literature review revealed that present teachers are not afforded many opportunities to learn or explore different assessment methods and strategies. School districts should provide the ways and means for their teachers to explore and research new ways to assess classroom learning in light of the recent importance, value, and accountability tied to student's test scores.
3. Educational agencies from around the state should organize in-service gatherings for technical education teachers to bring them up to speed concerning effective assessment methods and strategies. Universities, the Department of Public Instruction, and each educational district's CESA representatives need to take an active roll to bring it about.

Recommendations for Further Study

Some of the data gathered in this study have provided questions to warrant further studies of technology education teachers and their assessment methods. Recommendations are as follows:

1. Another study of a similar nature would be helpful to investigate why almost one third of technology educators from this sample viewed their assessments methods as only somewhat useful. Other studies from samples around the state would produce data to find out if other technology education teachers feel their assessments are only somewhat useful. Is this somewhat negative feeling about assessment methods widespread across the state or just in Southeastern Wisconsin?
2. Further research studies of technology education teachers in Wisconsin would be beneficial to compare to this research. The data may be further generalized to other samples from around the state. Thus, decision makers in planning learning experiences for current educators and students preparing to enter the teaching profession would be better informed and equipped to make effective decisions concerning student assessments.
3. Research of a similar nature should be conducted around the state with all teachers, not just technology education teachers. Assessment strategies are important tools to facilitate the learning process. If teachers from any discipline are not satisfied with what the assessment methods they use, it should be explored and steps should be taken to implement action plans to improve it.

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APPENDIX A.

RESEARCH QUESTIONNAIRE

Assessment Research Instrument

Directions: As a technology education teacher, you have been chosen to answer 12 questions relating to your assessment practices in the classroom. This study is for a masters thesis at UW-Stout. Please read the research consent form before answering the questions. For each of the traditional and alternative forms of assessments listed below, rate each one by circling the number representing how often you use them according to the scale provided.

1 Never Used
2 Used Sometimes
3 Used Frequently
4 Used Most of The Time

Traditional Forms of Assessment				
True or False Questions	1	2	3	4
Multiple Choice Questions	1	2	3	4
Completion / Fill in The Blank	1	2	3	4
Matching Questions	1	2	3	4
Essay Questions	1	2	3	4
Alternative Forms of Assessment				
Performance Assessments	1	2	3	4
Portfolios	1	2	3	4
Observation Techniques	1	2	3	4
Student Self Assessments	1	2	3	4

Directions: Circle the choice below that you feel describes your feelings about how useful your assessments are in the classroom.

1 Not Very Useful

2 Somewhat Useful

3 Useful

4 Very Useful

Directions: For each question below, circle the response that best describes you as a teaching professional .

I have been teaching for these number of years ..... 1-4 5-8 9-12 13 or more

The highest level, or beyond, of an educational degree I attained is ..... B.S. M.S. M.S. + credits

Seeking or teaching under an Emergency License

APPENDIX B.

COVER LETTER

University of Wisconsin-Stout

Menomonie, WI 54751-0790
Date

Name
Address
City, State

Dear Technology Education Teacher:

I am a graduate student pursuing a master's degree in technical education at UW-Stout. I am conducting a research study to gather information and perceptions about assessments technology teachers use and their effectiveness.

The intent of this study is to describe the types of assessments that are used by technology education teachers and gather perceptions on how useful these assessments are.

In order to complete my research I am asking technology education teachers like yourself to fill out the enclosed questionnaire, which should take about two minutes to complete. Your responses will remain strictly confidential. A numerical identification code will be used on the postage paid return envelope to assure anonymity and to use to identify people should requests for the return of the survey be needed. If at any time you would like to withdraw your responses, you are free to do so without prejudice. A research consent form is enclosed to assure your confidence of anonymity and to gain your acceptance to participate in this study.

Please complete the survey and return it in the enclosed pre-addressed postage-paid envelope. I would like to thank you for your cooperation and help.

Sincerely,

Darryl De Clute

Dr. Howard D. Lee, Ph.D. and Professor
University of Wisconsin-Stout