A VALIDATION STUDY OF THE TRIPLE E RUBRIC FOR LESSON DESIGN: A MEASUREMENT TOOL FOR TECHNOLOGY USE IN THE CLASSROOM

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This validation study examined the Triple E Rubric for Lesson Design as a measurement tool to test the effectiveness of a lesson when using technology to support learning goals. This study also measured the content and concurrent validity as well as reliability of the Triple E Rubric developed by Liz Kolb.
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CHAPTER 1

INTRODUCTION

Introduction to the Problem

Technology innovation continuously influences the present and future of educational practices (Christensen & Knezek, 2017; P. Ertmer, 2005; Ross, Morrison, & Lowther, 2010). As technology emerges, new opportunities arise for teachers that afford them the chance to engage in various pedagogical techniques that support learning goals (Diaz & Bontenbal, 2000; Koehler & Mishra, 2009). Teachers can create authentic lessons for teaching and learning with the understanding that it is essential first to establish learning goals and then choose pedagogic strategies and technology tools to meet outcomes (Okojie, Olinzock, & Okojie-Boulder, 2006; Spector, 2013). Careful and thoughtful lesson planning can lead to classroom technology use that reflects an environment that enhances the learning process (Spector, 2013). However, the effectiveness of technology utilization in the classroom is difficult to measure (Puckett, 2013). Many teachers and school leaders measure effectiveness by the amount of time the tool is used and not how the tool can be used to support learning objectives (Ally, Grimus, & Ebner, 2014). However, engagement includes participation in the learning outcome, not just involvement with the device or time on task. As educators plan lessons, it may be beneficial to use a combination of pedagogical strategies and technology tools so that students master learning goals (Wenglinsky, 2004). Using technology as a teaching and learning tool in the classroom can benefit students and teachers in many ways.

Student engagement is multi-faceted and comes in several forms, varying from lesson to lesson (Sinha, Rogat, Adams-Wiggins, & Hmelo-Silver, 2015). It is important that teachers view technology as a tool that can improve student engagement, communication, and collaboration,
close achievement gaps, modify work for individual students to meet individual learning styles, and put all students on a level playing field to close learning gaps (US Department of Education, 2017). As educators work to create lessons that integrate technology tools, there are several factors to consider as to which tool is the best to meet the learning outcomes. As technology tools become more prevalent in schools, the need for adapting teaching styles to empower the learning process also changes (Sinha et al., 2015). Essentially, the lesson designer must decide how to implement technology with confidence to improve student learning (Ertmer, Ottenbreit-Leftwich, & York, 2007).

Statement of the Problem

As teachers design curriculum, they have a specific purpose in mind: to meet the learning goals and improve student learning. Ultimately, the task of a teacher is to decide how to deliver and evaluate the success of a lesson. This can be difficult because there are countless factors to consider: pedagogical strategies, materials, technology tools, method of delivery, assessment, learner needs, and much more (Freeman, Adams Becker, Cummins, Davis, & Hall, 2017). Society is constantly changing; in this century we have moved from the industrial age to the age of information. As schools adopt curriculum, such as coding and digital literacy, educators are expected to make changes in curriculum and lesson designs (Liu, Ritzhaupt, Dawson, & Barron, 2016). While traditional methods of teaching are still widely accepted, emerging technologies are paving the way to transform teaching and learning (Orlando, 2014).

The Triple E Framework, which focuses on engagement, enhancement, and extension, contains a rubric that assesses a lesson before it is taught to determine if it effectively uses technology to meet learning goals (Kolb, 2017). The Triple E Rubric for Lesson Design (Triple
E Rubric) located in Appendix A can be a valuable measure of lesson design with technology tools for instruction and learning, but it has not been validated. A validated instrument based on the Triple E Framework would benefit educators by helping them determine if the technology utilized in a lesson is the right tool to meet the learning objective before the actual lesson. Designing and implementing instructional strategies that include the use of technology to master a learning outcome can be a challenging task for teachers (US Department of Education, 2017). Given that many emerging technologies support 21st century skills and apply to real-world practices, there is a need to help teachers plan authentic learning opportunities to meet learning goals in the most efficient way possible (Roschelle, Pea, Hoadley, Gordin, & Means, 2001). The development and implementation of research-based instruments can assist teachers in developing authentic lessons that can support learning goals (Elmendorf & Song, 2015; Spector, 2013; Woolf et al., 2010).

Background

The Triple E Rubric for Lesson Design is a tool that is based on the Triple E Framework created by Dr. Liz Kolb (2017) from the University of Michigan. The International Society for Technology in Education (ISTE) published her book, *Learning First, Technology Second: The Educator’s Guide to Designing Authentic Lessons*, which espouses the idea that technology supports learning goals and serves as a guide for educators to design instruction with technology tools (Kolb, 2017). ISTE is an organization that is an advocate for technology use in education and has developed standards for teachers, students, coaches, computer science educators, and administrators to navigate the digital age of the 21st century. The Triple E Framework for lesson design serves to assist teachers when planning lessons using technology and is based on three
instructional frameworks: technological pedagogical content knowledge (TPACK); substitution, augmentation, modification, and redefinition model (SAMR); and the technology integration matrix (TIM) (Kolb, 2017). “The Triple E [framework] takes the strongest pieces of these three frameworks and weaves them into a practical measurement tool that focuses on the learning goals before the technology tool” (Kolb, 2017). These frameworks serve as a more comprehensive way to approach lesson planning as a guide when considering technology tools in the classroom (Kolb, 2017). The TPACK, SAMR, and TIM models are discussed in more detail in the literature review.

Purpose of the Study

The purpose of this quantitative study is to establish content and concurrent validity as well as the reliability of the Triple E Rubric for Lesson Design (Triple E Rubric), a crucial part of the Triple E Framework.

The Triple E Framework provides educators with a practical way to measure whether authentic student learning is occurring when digital technology tools are integrated into a lesson. It also provides support to help educators make better instructional decisions when integrating digital technology tools (Kolb p. 5).

Research Questions

Does the Triple E Rubric offer a valid evaluation instrument to determine whether digital technology tools effectively support the learning goals? Does the Triple E Rubric have content and concurrent validity? Is the Triple E Rubric a reliable measurement for a technology-integrated lesson?
Hypotheses

H₁ – The Triple E Rubric for Lesson Design will demonstrate content validity.

H₂ – The Triple E Rubric for Lesson Design will demonstrate concurrent validity.

H₃ – Reliability of the Triple E Rubric for Lesson Design will be established by the consistency of the data resulting from two independent raters.

Significance of the Study

The validation of the Triple E Rubric for Lesson Design should contribute to the ability of educators to determine if the proposed integrated technology increases the quality of the lesson and ensures that it is effective for meeting the learning goals by providing evidence that it is a valid instrument for this purpose. This study contributes to the current literature as evidence that the Triple E Rubric will “…assist teachers to plan for technology use based on good instructional strategies” (Kolb, 2017, p.5).

Assumptions

This study is based on the premise that critical planning of technology tools for classroom teaching is crucial to improving student learning. The teachers who agreed to the study were asked to complete one lesson that integrated technology.

Limitations

There were 40 lesson plans submitted and taught by each of the 40 participants. Although the schools had a wide variety of technology tools such as computer labs, laptops, robotics equipment, 3D printers and more, all 40 lessons included student use of the iPad.
There were three research assistants and one lead researcher, all of whom served as Campus Technology Integration Specialists (CTIS) in a large suburban school district in southeast Texas. All four researchers collected the data from the participants. However only the lead researcher and one of the CTIS evaluated the data. The CTIS were chosen to assist in collecting data because of their expertise in the field of educational technology. To reduce bias, all researchers agreed to withhold coaching the teachers as the teachers developed their lesson plans. The CTIS did not disclose any information about the instruments used in this study.

Definition of Terms

Terms such as engagement and authentic learning are highly debated among researchers. It is essential to define specific vocabulary as it was used in the current study:

- **Authentic learning**: ISTE describes authentic learning as activities that are based on students’ real-world experiences or current issues and uses real data or work to solve real-world problems (What are the ISTE Standards, 2017)

- **Engagement**: According to Kolb (2017), engagement “considers how technology tools are helping the student focus on the learning goals and tasks...It is essential that engagement through technology is time on task, actively focused on learning goals, and allows students to participate in active social learning (co-use/co-engagement)” (p. 30).

- **Enhancement**: “Enhancement considers how technology tools help students develop an understanding of the learning goals that they could not otherwise have achieved...the technology supports co-use, active learning, differentiation, personalization, higher–level thinking skills, and real-world connections in ways that traditional tools could not.” (Kolb, 2017, p. 31).
• Extension: “Extension reflects how well technology creates a bridge between classroom learning and everyday lives.” (Kolb, 2017, p. 31).

• Learning goals: The learning goals are the objectives, including concepts, course outcomes, and the expected learning mastery of a student.

• One-to-one: For this study, one-to-one refers to an environment in which there is one technology device per student and one per teacher. Furthermore, the students can take the devices home during the regular school year. Teachers have a device year-round, including over summer break.

• Triple E Framework: The Triple E Framework is a model that helps educators decide what methods and strategies would best support the mastery of learning outcomes when designing lessons that incorporate technology. The model consists of three important components: engagement, enhancement, and extension (Kolb, 2017). Included in the framework is an instrument, Triple E Rubric for Lesson Design, which assists teachers in lesson planning that includes technology tools. The goal of the Triple E Framework is to combine all three components to create an exemplary lesson plan.
CHAPTER 2

LITERATURE REVIEW

Introduction

Educators face many barriers when creating lessons that integrate technology tools to meet learning goals (Freeman et al., 2017). Attitudes towards technology, availability of technology, the infrastructure of networks, type of device, and available applications can either be a barrier or enhance technology integration in the classroom. The success or failure of a lesson can influence student mastery of the learning goals (Christensen & Knezek, 2017; Cviko, McKenney, & Voogt, 2014; Ertmer, Ottenbreit-Leftwich, & York, 2007). A significant challenge is to design effective and authentic lessons using technology; it is difficult to determine what digital materials, tools, and applications to use to apply pedagogical strategies to support learning goals (Ally et al., 2014). This literature review explores technology integration, authentic learning, teacher effectiveness, instrument validation, and theoretical frameworks for teaching and learning.

Technology Integration

Technology can be integrated as a teaching aid, a learning tool, a tutor, and more (Vinet & Zhedanov, 2011). The number of applications for technology use in an educational setting is constantly growing. Because of the vast amount of technology tools available, it can be difficult for teachers to decide which tool or pedagogical strategy to use when designing lessons that use technology to meet learning objectives (Woolf et al., 2010). The technology itself does not ensure quality instruction. Instead, it is the careful and thoughtful planning of how and when to use technology tools to meet learning goals (Spector, 2013). Teachers who try new tools and
strategies may experience successes as well as barriers to meeting learning outcomes (Lam, 2014; Little, Goe, & Bell, 2009). As teachers design lessons that include technology, they will decide if the tool is useful in assisting with meeting the learning goals (Ross et al., 2010).

One popular trend in technology integration is the use of mobile learning devices such as tablets, smartphones, and other handheld devices. A meta-analysis that examined the use of mobile devices on student achievement found that the use of these handheld devices in the classroom showed higher achievement scores than traditional classrooms in all subject areas (Tingir, Cavlazoglu, Caliskan, Koklu, & Intepe-Tingir, 2017). The method for this meta-analysis consisted of a search of databases to find studies of mobile devices and student achievement in the areas of science, mathematics, language arts, and reading in K-12 classrooms. The search resulted in 1044 studies that were reviewed by five researchers. Inclusion criteria were established, and the final number of studies was reduced to 14. They were coded by study information, participant information, methodology, and effect size. The overall results showed that while scores were higher in all subject areas, reading scores were most improved through the use of mobile technology. It should be noted that a significant factor in the research studies is that the pedagogical approaches and lesson planning are crucial to the outcomes. It is the recommendation for future studies that researchers exploring the use of mobile devices in the classroom provide information on factors such as teaching strategies and include a comprehensive description of how the device is used in the classroom to meet learning goals (Tingir et al., 2017).

Technology integration can only happen if teachers are willing to try new tools and utilize available resources (Dawson, 2012). A teacher can significantly influence students’ perception of an idea, but ultimately several factors impact student learning, such as
environment, school resources, school and home culture, other teachers, and more (Little et al., 2009). A research study that examined how educators use pedagogical features of mobile learning found that teachers thought technology integration would lead to a more authentic learning experience for the student (Kearney, Burden, & Rai, 2015). The researchers created and validated a survey instrument that identified three constructs: collaboration, authenticity, and personalization of the apps on the device. One primary question in the study was, “how do educators use distinctive pedagogical features of mobile learning?”. A 30-question instrument was used to determine the answer. Data were collected from 195 school teachers in elementary schools and secondary environments from Australia and Europe. The survey topics explore teaching practices as they relate to mobile learning. Results from the survey found that the way the teacher plans and executes lessons with technology tools and pedagogical strategies has a considerable impact on how well the lesson provides an authentic learning experience. The lessons with tasks that are true to life and are relevant to the students’ lives outside of the class give the mobile device an authentic purpose for teaching and learning. The authors suggest that future research should investigate pedagogies that focus on the content rather than the device itself (Kearney, et al., 2015).

**Authentic Learning**

The New Media Consortium and the Consortium for School Networking (NMC/CoSN) 2016 Horizon is an annual report that identifies emerging, K-12 educational technology challenges, developments, and trends. The report identified authentic learning experience as a critical trend in K-12 Education (Adams, Freeman, Hall, Cummins, & Yuhnke, 2016). Researchers agree that authentic learning using technology can be beneficial for preparing
students for real-world applications. Constant changes bring about problematic challenges for educators. When identifying problems to improve the teaching profession, the report includes the need for teachers to become more of a facilitator or coach in order to plan and lead lessons that foster a student-centered approach to learning in order to promote authentic learning. Essential skills such as critical thinking and collaboration are vital for students and teachers to navigate in today's digital world (Tingir et al., 2017).

As teachers plan for lessons in the classroom, careful consideration of how to bring real-life experiences into a lesson to create an authentic learning experience could improve classroom instruction (ISTE Standards, 2017). The NMC/CoSN 2016 Horizon report also serves as a planning guide for educators, school leaders, and educational stakeholders (Freeman et al., 2017). The report showed that technology integration is continuously changing. However, some key trends have remained constant since 2012. Notable recent developments are the use of makerspaces, robotics, virtual reality, and cloud computing. One trend identified as providing “Deeper Learner Approaches” has remained at the top of the chart and is a recurring theme. According to the report, Deeper Learning Approaches may involve preparing students for success through six competencies: mastering rigorous content, critical thinking and solving problems, collaboration, effective communication, self-direction for learning, and developing an academic mindset (Freeman et al., 2017).

A study by Mango (2015) described students in a foreign language class using multiple apps for creativity to demonstrate mastery of the content. The students involved in this study answered a questionnaire about their participation. The results of a nine-item, five-point Likert scale explored gauging perceptions as well as involvement while learning with the iPad. Students
were able to choose their own apps, and researchers found their motivation and engagement of the material as high.

A different study by Reid and Ostashewski (2011) found that the use of applications for literary strategies on elementary classroom iPads to be efficient in developing digital storytelling skills. The study examined language and literacy innovation through the use of creativity apps for authentic learning. Students created artifacts to demonstrate learning that would not be possible without the iPad and the specific applications on the device (Reid & Ostashewski, 2011).

A study that explored iPad use among girls ages 13-16 found that lessons with iPads were more engaging than without the iPad, learning was extended beyond the school day, and there was more time to collaborate with other students. The data from the survey were found to be statistically significant using triangulated group interviews about classroom experiences (Tay, 2016). Additionally, classroom observations of lessons with the use of the iPad showed that learning was enhanced when the teacher lecture was reduced, and student interaction with the learning outcome was increased by iPad use (Tay, 2016).

Teacher Effectiveness

Measuring the effectiveness of a teacher remains a critical topic in education. Teacher effectiveness has been highly debated. Most researchers agree that teacher effectiveness is multi-dimensional and the implementation of pedagogical strategies to execute a lesson can affect learning outcomes (Christenson, Reschly, & Wylie, 2012). Defining teacher effectiveness is very complicated (Dunlap, 2014). A synthesis of the research (Goe, Bell & Little, 2009 p. 8) describes teacher effectiveness as:
• Effective teachers have high expectations for all students and help students learn, measured by value-added or other test-based growth measures or by alternative measures.

• Effective teachers contribute to positive academic, attitudes, and social outcomes for students, such as regular attendance, on-time promotion to the next grade, on-time graduation, self-efficacy, and cooperative behavior.

• Effective teachers use diverse resources to plan and structure engaging learning opportunities; monitor student progress formally, adapting instruction as needed; and evaluate learning, using multiple sources of evidence.

• Effective teachers contribute to the development of classrooms and schools that value diversity and civic-mindedness.

• Effective teachers collaborate with other teachers, administrators, parents, and education professionals to ensure student success, particularly the success of students with special needs and those at high risk of failure.

Studies in the research synthesis used different instruments and methods to measure teacher effectiveness that included classroom observations, principal evaluation, instructional artifacts, portfolios, teacher self-report, student survey, and a value-added model (Goe, Bell, & Little, 2008). The goal of this synthesis was to provide research to educational stakeholders to aid in understanding teacher effectiveness. The significant findings from this research resulted in several policy recommendations and implications when considering how to measure teacher effectiveness. One recommendation was to assess teacher effectiveness through the use of classroom observations. Another critical recommendation was to ensure that raters are trained with the use of the instrument to safeguard the validity and reliability of the scores (Goe et al., 2008).

The technology itself does not ensure quality instruction. Instead, it is the careful and thoughtful planning of how and when to use technology tools to meet learning goals (Spector, 2013). Teachers who try new tools and strategies may experience successes as well as barriers to meeting learning outcomes (Lam, 2014; Little et al., 2009). As teachers design lessons that
include technology, they will decide if the tool is useful in assisting with meeting the learning goals (Ross et al., 2010).

An additional study by Little (2009) also measured teacher effectiveness through the means of observations in the classroom and suggested that classroom observations are considered the most direct way to determine what is happening in the school; the observer can experience the class in real time. When conducting an observation, the use of a valid and appropriate instrument is crucial to the process.

Teacher Evaluation Systems

The purpose of teacher evaluation is to strengthen the teaching process and to continually re-evaluate the educational needs of the student (Davis, 2013). Teacher evaluation in the United States is a topic that is appearing at the forefront of schools. Federal funding that focuses on quality instruction and initiatives such as No Child Left Behind is based on teacher ratings and student growth on standardized tests and is not widely accepted among teachers (Darling-Hammond, 2014). The Every Student Succeeds Act (ESSA) is an educational law passed to transform schools and evaluate teachers. The U.S. Department of Education (2018) states, “The evaluation systems we envision would include a range of summative and formative components, such as an analysis of teacher responsibilities and accomplishments, measurements of student growth data, results from formal observations, self-evaluations, and feedback from students and peers” (Section VII-Teacher Evaluation and Development | U.S. Department of Education, 2018). Teacher evaluation systems are used in school districts across the United States and in other developed nations across the world (Marzano, 2013). One example of an evaluation system is the Mid-Continent Research for Education and Learning (McREL) Evaluation Rubric for
Educators that was created in partnership with the North Carolina Department of Public Instruction (McREL, 2015).

Currently, there are many teacher evaluation instruments used to measure teacher effectiveness. Some school districts are focusing more on classroom observation and less on standardized test scores. For example, Nevada, Kentucky, and Florida recently reduced the percentage that standardized scores account for teacher evaluation (Loewus, 2018). The McREL Teacher Evaluation System is currently used in several school districts in the United States. One district in Michigan adopted the McREL because it has been established as a valid tool for evaluating teachers through observation (McREL, 2013) Additionally, A three-year study by the Bill and Melinda Gates Foundation called Measures of Effective Teaching Project (MET) studied 3000 teachers from seven districts across the United States. Several key findings were uncovered. “Adding a second observer increases reliability significantly more than having the same observer score an additional lesson” (MET, 2013, p. 7). This key finding is important because when using teacher observations for evaluations, it is best to have more than one observer in order to increases reliability. Data was collected by recording a teacher while teaching a lesson to provide a video and shorter walkthroughs by administrators. The video-based observations were rated by observers who did not work at the school to reduce in-school bias. This particular study consisted of administrators and peer observers who were trained using an observation instrument that is based on Charlotte Danielson's framework for teaching. The researchers collected data from 24 lessons and found that when there is more than one observer, reliability increased. Researchers from the MET Project (2013) state, “There is great potential in using video for teacher feedback and the training and assessment of observers” (p. 20).
Instruments for Educational Use

Updated and improved instruments are necessary to measure teaching strategies and methods (Spector, 2013). Popular instruments related to educational technology evaluate a teacher’s attitude or self-efficacy toward technology integration (Knezek, Christensen, Miyashita, & Ropp, 2000). Carefully planned lessons by the teacher can increase student engagement and mastery of content objects (Fredricks, Blumenfeld, & Paris, 2004). Finding a solution to improve student engagement for increased academic achievement must first be defined and measured in a scientific way. Many researchers and educators agree that student engagement leads to positive learning outcomes. Measuring engagement such as behavioral engagement, emotional engagement, and cognitive engagement is challenging (Sinatra, Heddy, & Lombardi, 2015). The reason for measuring engagement is to improve student learning; however, there are various approaches, instruments, and methods to determine student engagement.

A recent study sought to identify instruments that measure student engagement and found 21 instruments with documented reliability and validity (Fredricks et al., 2012). The researchers found varied topics related to student engagement such as engaged time, student engaged in learning, and engagement in school work. Of the 21 instruments, there were four that were identified as observational measures. All four were deemed reliable by inter-rater reliability. Three of the instruments had established construct and criterion-related validity. All of the instruments reviewed in this study may not have measured all areas of engagement but did have at least one specific measure of engagement.

Establishing reliability and validity of an instrument for educational use is the first step to using an instrument for research purposes. In 2010, researchers created the Technology
Integration Assessment Rubric to score lesson plans using a rubric based on TPACK (Harris, Grandgenett, & Hofer, 2010). For validity, the researchers found six experts to review the rubric and gather comments about the rubric. This rubric was found to be sufficient for assessing lesson plans for technology integration. However, some limitations were that the lesson plans were very detailed and most teachers do not compose detailed plans required for this rubric.

Instructional Frameworks

The three main instructional frameworks discussed in this section are the Technological, Pedagogical and Content Knowledge (TPACK), the Substitution, Augmentation, Modification, and Redefinition model (SAMR), and the Technology Integration Matrix (TIM). These three frameworks make up the backbone of the Triple E Framework (Kolb, 2017). All of these frameworks are currently used in educational settings, and research supports these frameworks as valid guides for planning lessons using technology (Barbour, 2014; Koehler & Mishra, 2009; Tay, 2016).

Technological, Pedagogical and Content Knowledge (TPACK)

Technology integration is one of the three essential factors in technological, pedagogical and content knowledge (TPACK) model. There are the three core competencies that make up this model. Each part overlaps in the center, and when all three are implemented during lesson planning and delivery, it can be beneficial to teaching and learning (Mishra, Koehler, & Henriksen, 2011). TPACK stresses that intertwining all three competencies of the model can create a learning environment to improve education (Vinet & Zhedanov, 2011). The technological knowledge needed for TPACK includes the teacher being able to use technology
tools that are ever-changing. An ethnographic multiple case study of teachers using technology in the classroom found that effective technology integration is successful if the teacher is open to the idea of developing his/her self-efficacy to apply new strategies in the classroom (Saudelli & Ciampa, 2014). Subsequently, teachers should be open-minded and be able to adapt to new technology and pedagogies to increase student engagement and to master content (Koehler & Mishra, 2009) A teacher’s knowledge about using technology with students significantly impacts the use of technology in the classroom. Use of technology tools depends on how the teacher sees the usefulness of the tool for either teaching or learning (Koehler & Mishra, 2009; Spector, 2016). Another case study looked at how teachers reflected on how they utilized technology in the classroom to meet learning goals and concluded that the TPACK model could assist in lesson planning to maximize the applications it has to offer (Hilton, 2016). A case study of how teachers use digital tools in the classroom found that the more knowledge about TPACK educators have and apply to teaching, the more it can lead to a well-balanced environment that improves student learning and engagement (Hutchison & Woodward, 2014). The 2016 K-12 edition of the New Media Consortium/ Consortium for School Networking (NMC/CoSN) Horizon report supports the idea of using TPACK to help educators integrate technology to meet learning outcomes effectively (Adams Becker, Freeman, Giesinger Hall, Cummins, & Yuhnke, 2016). A meta-analysis by Ronau, Rakes, and Neiss (2012), focused on identifying the reliability and validity of 141 instruments designed to measure TPACK found that in the area of self-reporting, there were only 11 studies that reported issues with reliability and validity. The researchers recommended that future studies on TPACK should include measures to eliminate reliability and validity discrepancies for forthcoming instruments created that measure the TPACK framework.
The SAMR model is a framework developed by Dr. Ruben Puente-dura and is used to assist teachers in integrating technology into their lessons (Puente-dura, 2013). The first level is the enhancement category with substitution, then rising to augmentation. The second level is known as the transformation category with modification and then redefinition on the top. Each level is described by Puente-dura (2013),

- **Substitution** - Technology acts as a direct tool substitute with no functional change.
- **Augmentation** - Technology acts as a direct tool substitute, with functional improvement.
- **Modification** - Technology allows for significant task redesign.
- **Redefinition** - Technology allows for the creation of a new task, previously inconceivable.

A qualitative study of eight pre-service teachers using iPads for learning found that the applications on an iPad helped improve student engagement, group work, and communication. Many of the strategies that the participants used were on the top level of the SAMR model, redefinition because students were creating products that would not be possible without the utilization of the iPad (Pegrum, Oakley, & Faulkner, 2013). The SAMR model is a relatively new framework, and more research for its application with technology is necessary (Hilton, 2016). A survey answered by 131 high school students revealed the students did not have a positive reaction using a mobile tablet. However, the researchers stated that the teachers were not adequately trained and should balance all three aspects of the TPACK model to make sure the technological knowledge for teaching is implemented. By introducing educators and administrators to a combination of the SAMR and TPACK model, teachers will understand how and why using a variety of tools can help the process of teaching and learning (Hilton, 2016).
In a critical review of the SAMR model, researchers found that the popularity of the model has grown since 2013. In 2013, only one mention of the SAMR model appeared in the ISTE conference sessions descriptions. In 2015, the annual ISTE conference included 44 sessions where SAMR was included in its descriptions (Hamilton, Rosenberg, & Akcaoglu, 2016). Researchers suggest that the SAMR model is simple; it could be defined a bit more to reflect its use to first focus on the learning outcome rather than the level of technology integration. Kolb (2017) addresses this notion by explaining that,

SAMR does not directly address how learning goals play a role in the technology choice…We want to make certain that when we look at the SAMR model, we also are considering the learning outcomes and not just the unique ways that the technology tool is changing the way classroom activities happen. The Triple E Framework helps extend the SAMR model by making these connections (p. 25).

The Technology Integration Matrix (TIM)

Researchers from the University of South Florida Center for Instructional Technology created the Technology Integration Matrix (TIM). The TIM is a framework designed to evaluate technology integration in the classroom. The TIM framework revolves around best practices and assists the educator in choosing how to use technology tools to meet learning objectives. The TIM is a practical guide for using technology in the classroom.

The purpose of the TIM is to plan technology-infused lessons that support student engagement by following a comprehensive matrix for integrating technology, pedagogical strategies with content to spark critical thinking, and problem-solving skills for learning. It has five levels of technology integration (entry, adoption, adaption, infusion, and transformation) and five characteristics of the learning environment (active, collaborative constructive, authentic and goal-directed). This model can be a handy guide for teachers, but because of the many
components it can be unwieldy and take a lot of time for the teacher to decide which level of the technology to use when planning classroom activities (Harmes, Welsh, & Winkelman, 2016).

As educators seek to implement technology tools, the attitudes of the teacher toward technology can be a barrier that can impede the use of technology in the classroom (Sawyer, 2017). Factors such as teacher confidence, access to technology, and technology support all influence how technology is integrated into the classroom environment (Liu et al., 2016). A correlational–predictive study that used the TIM model investigated the relationships between teacher perceptions of technology use and observed classroom technology levels and found a statistically significant relationship between the two. Researchers recently designed and tested a model of classroom technology integration using a multilevel path analysis model that explored teacher characteristics and school-related variables. The results concluded that teacher attitudes and teacher comfort level were strong indicators of technology integration. Some other factors that affect the levels of technology integration are the years of teaching experience and the number of students per class. The researchers suggested that future research should use both quantitative and qualitative data methods to explore the intricacy of technology integration (Liu et al., 2016).

While teacher attitudes are essential for technology integration, having an environment conducive to authentic learning is a factor in how technology can support the learning goals. Practicing 21st-century skills in an environment that promotes technology use can lead to mastering content in and out of the classroom (Dotong, De Castro, Dolot, & Prenda, 2016). The TIM model supports authentic learning and helps the teacher by providing a model for technology integration that can transform the levels of technology use in a meaningful, authentic way (Welsh, Harmes, & Winkelman, 2011).
CHAPTER 3
RESEARCH METHODOLOGY

Introduction

The goal of this study was to explore the content and concurrent validity of the Triple E Rubric for Lesson Design (Triple E Rubric) which can be viewed in Appendix A. The purpose of the Triple E Rubric is to guide teachers while developing lessons with integrated technology and determine if the technology use is appropriate for meeting the learning goals (Kolb, 2017). A second instrument, the Mid-Continent Research for Education and Learning (McREL) Teacher Evaluation Rubric can also be viewed in Appendix B and is used to measure teaching effectiveness through classroom observation. The validated McREL tool has similar constructs and is used to evaluate educator performance while facilitating a lesson using a variety of tools. The rationale matrix which illustrates the nine items from the Triple E Rubric and the variables from the McREL Teacher Evaluation Rubric is located in Appendix C.

Participants

The participants in this study were educators from four junior high schools in a large suburban town in southeast Texas. One hundred and ninety-five teachers were eligible to participate in the study. A simple random sample technique was used to select and invite the teachers to participate. A spreadsheet containing the names of all junior high certified teachers that currently teach at the district's junior high schools was created. Then, a random sampling method on Microsoft Excel was used to select teachers, and an invitation was sent to potential participants. This process was repeated until 10 teachers from each school, for a total of 40 teachers, agreed to participate. All teachers signed a consent form and any students who were
included in the videotaped observations signed and returned an assent form. Additionally, parents of any student included in the observation signed a consent for to allow the student to be videotaped. See Appendix D for consent and asset forms.

The school district has adopted the TPACK and SAMR frameworks for lesson design, so all teachers have attended professional development on these frameworks. All teachers were issued an iOS device and receive continuous training for lesson design related to technology integration from instructional coaches in the school district. Additionally, all teachers attended training from an Apple certified trainer before the one-to-one program began. All teachers are expected to participate in ongoing professional development in the area of technology integration instructional strategies provided by organizations inside and outside of the district.

Setting

The setting was appropriate for a study of this type due to the accessibility of technology tools in these classrooms for both students and teachers. The four junior highs were executing a one-to-one iPad initiative that began with seventh-grade students in fall 2014 and progressively added another grade level each year. As of fall 2018, all junior high students, high school students and teachers had access to an iPad for use in the classroom as well as at home. The student iPads were managed, and paid and free apps that focus on creation, productivity, and collaboration were approved by the technology instructional design team for both teachers and students. Teachers were also able to download additional apps from the Apple App Store. In addition to iPads, all schools had access to other technology equipment, such as computer labs, laptops, robotic equipment, 3D printers, document cameras, and more. All classrooms were equipped with many resources to execute multiple teaching strategies. On all four of these
campuses, many of the common barriers to technology had been overcome to achieve seamless technology integration for learning.

Technology equipment is managed by the district technology department, including one technician and one campus technology integration specialist (CTIS) at each campus. Teachers were encouraged to integrate technology tools, and they were provided with continuous professional development for technology integration from the CTIS. Teachers received one-on-one training as needed, as well as monthly technology workshops. The district utilized Canvas, a learning management system, that was available for all junior high teachers, high school teachers, and all secondary students at the time of the study. Additionally, there were numerous technology tools, and an IT support team available to service devices and maintain a robust WiFi network. All classrooms were equipped with a teacher desktop computer that connected to an LCD projector. Furthermore, classrooms had an Apple TV attached to the LCD projector as well as a built-in sound system. Teachers could connect the iPad with the Apple TV to wirelessly display on the projector screen. Moreover, each classroom was equipped with a WiFi access point, providing high-speed Internet that could handle up to 60 devices on the student WiFi network. In addition to technology resources, teachers had access to print materials as well as other traditional teaching tools. The school district’s vision was to incorporate technology as a learning tool while not making it the focus of instruction. Teachers had technology resources that were tools for teaching and learning; the main focus was the content and the use of technology as a tool to prepare students with 21st-century skills and knowledge.
Data Collection

The data collection in this study consisted of a teacher-written lesson plan, and an observation of the lesson in the classroom. Each teacher who participated in the study signed a consent form, and all students who were in the class for the observation signed an assent form. Parents also signed a consent form before any observation occurred. All consent forms and data collection procedures were approved by the institutional review board (IRB) at the University of North Texas. The lead researcher, as well as the additional researchers, who all serve as the four junior high CTIS in the school district, agreed to collect data used in this study. Each teacher who agreed to participate in the study submitted a lesson plan using an online template provided by the researcher. Appendix E contains the items from the online lesson plan template. The classroom observation consisted of a video with the teacher facilitating a classroom activity or lesson with the use of technology. Each teacher was recorded using audiovisual equipment provided by the researcher. The teachers who participated in this study did not receive any formal training in the use of the Triple E Framework or Triple E Rubric.

Once the completed lesson plan template was submitted, a researcher conducted a semi-structured face-to-face meeting with the teacher to answer any questions about the lesson before recording the actual observation. The decision to use audiovisual equipment was made to maintain the classroom environment in its most natural state to obtain observation data, allowing the researcher to observe the classroom in a non-intrusive way. The researcher set up an audiovisual device and trained the teacher on how to use the device during the pre-observation session. The teacher and researcher together agreed on the location of the recording device in the classroom. It was placed in the least distracting area for the students and teachers, so the device would capture the teacher with minimal instructional interruption. The recording device helped
prevent the awkwardness of an extra adult presence in the classroom. Instead, the camera was stationary and purposefully placed so as not to attract too much attention. The lesson was then reviewed by two of the researchers and rated using the McREL Teacher Evaluation Rubric.

Due to the researchers being affiliated with the school district, they had an interest in improving the use of educational technology in the classroom environment; however, bias was reduced by maintaining a professional composure with the participants. Teacher and student bias were also reduced because the researchers did not conduct the observations in the classroom during the lesson. The researcher established norms in order to avoid bias when rating the lessons and observations. The researchers did not coach or co-teach during the data collection or prior to the lesson planning. To avoid additional bias, they were limited to rate each lesson and teacher by only what was contained in the lesson plan and only what was observed on the video.

The researchers conducted a short fifteen-minute training session with each teacher on how to operate the recording equipment. Swivl, a mobile recording device that sits on a stationary tripod with a swiveling top and a removable tablet, was used to record each lesson. Swivl includes an app that has the capability of instantaneously sharing the video to a private, password-protected account via cloud computing. Each teacher wore a lanyard-style, wireless microphone to capture clear audio of what he or she said. The lanyard contained a built-in tracking device that allowed the Swivl to “follow” the teacher while recording the lesson. The teacher could also use the remote control on the lanyard to control the recording and to mute if necessary. There was a researcher on standby on each campus to help the teacher with any technical difficulties that might have arisen using the Swivl. The teacher recorded one complete integrated-technology lesson. By not having a researcher in the room during lesson delivery, bias on the part of the student and teacher were reduced.
After collecting the data, two raters completed the Triple E Rubric for the lesson plan and the McREL Teacher Evaluation Rubric while reviewing the videos. The data from both rubrics were placed on a spreadsheet, coded and put through a series of statistical tests to determine the concurrent validity and inter-rater reliability that is discussed later in the data analysis and results sections of this study.

Instrumentation

Triple E Rubric for Lesson Design

The Triple E Rubric for Lesson Design (Triple E Rubric) focuses on lesson design and has three constructs related to technology integration. Each construct has three supporting variables used to rate the lesson. The rubric includes nine items total and is used to evaluate a lesson before it takes place. It looks at the written lesson plan rather than the actual lesson itself. The Triple E Rubric was created in conjunction with the Triple E Framework by Dr. Liz Kolb, (Kolb, 2017). The Triple E Rubric has three components: engage, enhance, and extend, each containing three questions in relation to learning goals. The goal of the rubric is to provide a way for teachers to quickly evaluate a lesson plan to determine if the technology tool should be used in the lesson. The Triple E Rubric has nine questions for educators to ask themselves to decide if the technology tool is the best option for lesson delivery. The Triple E Rubric comes with a key with recommendations of how to proceed based on the final score of the rubric. If there is a low score, the teacher should consider an alternate tool or strategy to improve mastery of the learning outcome. This tool can provide teachers with a quick and simple way to evaluate the use of proposed technology in a lesson.
The Triple E Rubric should be used with a general understanding of the Triple E Framework as described in Dr. Liz Kolb’s book, *Learning First, Technology Second. The Educators Guide to Designing Lessons* (Kolb, 2017). A major theme of the framework is that teaching with technology is first about considering the content goal and second about considering the technology tool and teaching strategy (Kolb, 2017). It is important for the teacher to consider all pedagogical strategies and then determine if the technology tool is appropriate to meet the learning goals. An instructor should weigh options when it comes to student engagement so as to not distract from the learning goals but rather, to enhance them by the selected technology tool. The Triple E Rubric for Lesson Design assists the teacher in deciding on strategies and tools for meeting the learning goal. The technology tools used in meeting content goals should add value to the lesson and not cause a distraction (Kolb, 2017). It is important that the educator carefully consider how integrating technology into a lesson that will extend the learning and provide a real-world experience for the student (Mishra, Koehler, & Bragg, 2006).

The Triple E Framework serves as a guide to help teachers integrate technology and choose pedagogical strategies for teaching (Kolb, 2017). “By design, the teachers would rate their lesson with the Triple E Rubric using recommendations based on the final score from the Triple E Framework” (Kolb, 2017, p. 87). The scoring conventions are No = 0 points, somewhat =1 point, and Yes = 2 points. The highest score would be a total of 18 points. The rubric includes a key to the point totals. The Triple E Rubric with the key is in Appendix A.
Mid-Continent Research for Education and Learning (McREL) Teacher Evaluation Rubric

The Mid-Continent Research for Education and Learning (McREL) Teacher Evaluation Rubric has five standards with 25 variables. The teacher evaluation system developed by McREL in partnership with the North Carolina Department of Public Instruction (NCDPI) and is used to measure teacher effectiveness and has been demonstrated to be an adequate measure with established research-based validity (Bradshaw, 1990; Davis, 2014). The McREL was assessed for internal-consistency reliability using Rasch analysis. The results demonstrated acceptable reliability for measuring the differences in teacher performance. The random sample of 3000 teachers from a population of 116,629 was used in the study. The samples came from teacher observations, and the results indicated results of the Rasch analysis of .80-.94 which is adequate to discern between high and low performing teachers (Davis, 2014). According to the McREL (2014), teacher evaluations through the use of observations were based on the following standards and their corresponding sub-standards and is available in Appendix B:

I. Teachers demonstrate leadership

II. Teachers establish a respectful environment for a diverse population of students

III. Teachers know the content they teach

IV. Teachers Facilitate learning for their students

V. Teachers reflect on their practice

Rationale Matrix

After researching and reviewing several instruments, the lead researcher determined that the 9-item Triple E Rubric and the McREL Teacher Evaluation Rubric were a comparable match for this study. The 26 items from the McREL instrument were narrowed down to nine
observational items that directly correlated to the items on the Triple E Rubric. The matrix was presented to a panel of experts agreed there was enough evidence of content validity; the complete rationale matrix is in Appendix C.

Data Analysis

Although there were four researchers collecting data, only two researchers participated in the analysis of the data. The lead researcher and one of the CTIS independently scored the 40 lessons and video observations using the instruments in the study in order to establish inter-rater reliability. These two raters participated in training to become proficient in the use of the Triple E Rubric and the McREL Teacher Evaluation Rubric. Each researcher read the book, *Learning First, Technology Second: The Educator’s Guide to Designing Authentic Lessons* and participated in an extended Twitter slow chat/book study while reading each of the sections in the book. The raters reviewed the McREL participant’s manual to properly rate the teacher observations. Each rater was provided with a printed copy of the completed lesson plan and access the 40 recorded lessons. The Triple E Rubric was used to score written lesson plans and the McREL Teacher Evaluation Rubric was used to score the teacher classroom observations.

Content validity was agreed upon by a panel of three experts in the field who established that the items on the McREL Teacher Evaluation Rubric and Triple E Rubric for Lesson Design were a good match for the comparison to the Triple E Rubric. Copies of the Triple E Rubric, McREL Rubric, and the rationale matrix (Appendix B) were provided via email to the three experts. The experts reviewed the matrix and completed a short online form to provide information on content similarities between the two instruments. The panel agreed that there were items with similar content on both instruments.
Salkind describes concurrent validity as, “Concurrent validity focuses on the extent to which scores on a new measure are related to scores from a criterion measure administered at the same time” (p. 209). For this study, the Triple E Rubric and the McREL have variables that relate, the experts agreed on face validity between the two instruments. The McREL teacher evaluation is the instrument with established validity. The lead researcher coded the data and computed a correlational analysis of the items from the Triple E Rubric with the McREL Teacher Evaluation Tool using IBM’s Statistical Package for the Social Sciences (SPSS). Spearman’s rank correlation coefficient was used to calculate the monotonic relationship between the scales. Pearson product moment correlation coefficient was used to calculate linear relationships between the scales and the effect size, using $r^2$, was calculated to determine the relative strength of each correlation.
CHAPTER 4

RESULTS

The results included in this study are correlations between the data from the Triple E Rubric and the McREL Teacher Evaluation Tool. The Triple E Rubric was used to rate lesson plans written by the participants in the study, and the McREL was used to evaluate the teachers’ actual delivery of the classroom lessons. The data from the two instruments were then coded, and statistical tests were conducted to determine reliability and correlational significance between the data from the two instruments. These tests were necessary to establish evidence of concurrent validity and inter-rater reliability of the Triple E Rubric.

Descriptive

Forty junior high (6th through 8th grade) teachers from one school district agreed to participate in this study. Of the 40 lesson plans, 12 were from 6th-grade classes, 10 were from 7th-grade classes, and 18 were from 8th-grade classes. The class subjects included in this study were 8 language arts, 7 mathematics, 10 science, 10 social studies, and 5 elective classes. There was a total of 10 different teachers and lessons from each of the four junior high schools. Data collection occurred over a two-month period in April and May 2018.

Content Validity

A panel of three university professors who are experts in the area of education and instructional design who reviewed the proposed rationale matrix and agreed that the variables in the Triple E Rubric and the matching variables from the McREL Teacher Evaluation Tool were a close match, and the instruments showed evidence for content validity. The experts were asked if
the identified research variables closely fit the constructs from both instruments. Once content validity was established, the researcher utilized the two instruments to rate the teacher lesson plans and the subsequent observations.

Reliability Analysis

Inter-rater reliability was established by having two raters score the written lesson plans and recorded observations. Cohen $k$ was used to determine if there was an agreement between the two raters on the Triple E Rubric and the McREL Teacher Evaluation Tool. All the data from each instrument were arranged into two columns labeled as Rater 1 and Rater 2. Correlation analyses determined a very strong agreement in the ratings obtained on both the Triple E Rubric: $k = .812, p < .001.$ and the McREL scale: $k = .781, p < .001.$ The results were significant and indicated a very good degree of agreement with the Triple E Rubric and a good degree of agreement with the McREL Teacher Evaluation. Additionally, Rater 1 consistently had higher values compared to Rater 2. Overall, the results were within an acceptable range, indicating that the inter-rater reliability agreement did not happen by chance alone (Salkind, 2010).

Concurrent Validity

Concurrent validity can be defined as comparing measures of one construct against an established valid construct (Salkind, 2010). In order to establish concurrent validity, the constructs should be relevant, free from bias, and reliable. Salkind (2010) states, “The strength of the relationship between scores on the new measure and the scores on the criterion measure indicate the degree of concurrent validity of the new measure” (p. 209). For this study, concurrent validity was established by using the coded variables from the Triple E Rubric and
the matching variables from the McREL Teacher Evaluation Tool. The total scores from each
rubric were compiled and reported for Rater 1 and Rater 2. Each of the nine variables from the
Triple E Rubric and the McREL Teacher Evaluation Rubric from both raters was calculated and
averaged together and reported as a single measure. The Spearman’s rank order correlation and
Pearson product moment correlation were used to determine the strength of the linear
relationship between the variables. The effect size was calculated using the value of the Person
product moment correlation coefficient \(r\) and squaring it \(r^2\).

Total Scores

After assessing the total score of a lesson, the main objective of the Triple E Rubric is to
determine whether or not to continue with the lesson as written. The Triple E Rubric has nine
items, and each item is scored with a 0, 1, or 2. However, in this study, the scores were converted
to variable ranks to equal scores of 1, 2, or 3 so that in SPSS the rating of 0 would not skew the
data. The McREL items were coded for each of the ratings and earned a score of 1, 2, 3, or 4.
The total scores from each instrument were compared using Spearman’s rank order correlation
and revealed a statistically significant strong positive relationship. The total scores by Rater one
and two were averaged into one measure, \(r_s = .78\) \(p < .001\). Figures 1 and 2 illustrate the
monotonic relationship of the total scores from the Triple E Rubric and the McREL Teacher
Evaluation rubric by Rater 1 and Rater 2.

A Pearson product moment correlation coefficient was computed to assess the
relationship between the total scores on the Triple E Rubric and the McREL. The results for
Raters 1 and 2 were averaged into one measure that demonstrated a strong positive relationship, \(r
= .820, n = 40, p < .001\) with an effect size of \(r^2 = .67\). These correlational results indicate a
statistical significance that is very strong evidence of the concurrent validity of the Triple E Rubric for Lesson Design (Salkind, 2010).

Figure 1. The Spearman’s rho result of a monotonic positive relationship between the total scores from Rater 1.

Figure 2. The Spearman’s rho result of a monotonic positive relationship between the total scores from Rater 2.
The total scores are a principal part of this study because they are the first to be analyzed when using the Triple E Rubric. The key serves as a guide, based on the total score from the Triple E Rubric and directs the user to review each of the constructs and modify the lesson if needed. The key is broken down to three levels with advice for altering the technology or instructional strategy before teaching a lesson. The total scores for the Triple E Rubric and McREL show strong evidence of concurrent validity.

Triple E Rubric and McREL Variables

The variables for this study are the nine Triple E Rubric questions and the correlated items from the McREL instrument, each described in the following sections. The scores for both raters obtained from the Triple E Rubric and the McREL were averaged to provide a single measure. See Appendix C for the detailed rationale matrix with matching variables from each of the instruments. The following table illustrates a comparison of the correlational scores and the standards from the Triple E Rubric and the McREL variables and are color coded by the three constructs from the Triple E Rubric, engage, enhance, and extend as well as the total score. Overall, the results show a strong positive correlation and each of the Triple E constructs show that the results are favorable for concurrent validity. The results from Spearman’s rho showed four of the nine items were a very strong correlation, two were a strong correlation, and three were a moderate correlation. The results from the Pearsons product moment correlation coefficient showed that four items were a very strong correlation, one was a strong correlation and four were a moderate correlation. A main factor that could have contributed to the moderate scores was the fact that the lesson plan did not reflect what the teacher actually did during the lesson observation. The nature of teaching is constantly fluctuating and that may result in some
inconsistencies for scoring between the written lesson plan and what happened during the
teaching observation as well. Another factor may be a result of uncertainty between the variables
from items Extend 1 and McREL Standard IIIa. More details are included in the discussion
section of Chapter 5.

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Triple E Rubric Engage 1

The results for Variable 1 from the Triple E Rubric, (Engage 1), “The technology allows
students to focus on the assignment or activity with less distraction. (Time on Task)” (Kolb,
2017, p.85). and McREL Standard IVa, “Teachers know the ways in which learning takes place,
and they know the appropriate levels of intellectual, physical, social, and emotional development
of their students” (McREL, 2013, p. 19), was calculated using Spearman’s rank order correlation
and exhibited a very strong positive relationship between Engage 1 and Standard IVa, \( r_s = 814, p < .001 \). A Pearson product moment correlation coefficient was computed to measure the
relationship between Item 1 on the Triple E Rubric (Engage 1) and Standard IVa from McREL.
There is a strong positive correlation between the two variables, \( r = .841, n = 40, p < .001 \) with
an effect size of \( r^2 = .70 \). These results demonstrate very strong evidence for concurrent validity
which is statistically significant among the two variables (Salkind, 2010).
Triple E Rubric Engage 2

The results for variables from the Triple E Rubric, (Engage 2), “The technology motivates students to start the learning process.” (Kolb, 2017, p. 85) and McREL Standard IIIb, “Teachers know the content appropriate to their teaching specialty” (McREL, 2013, p. 17), were calculated using Spearman’s rank order correlation. A statistically significant strong positive relationship was obtained between Engage 2 and Standard IIIb, $r_s = .623, p < .001$. A Pearson product moment correlation coefficient was computed to measure the relationship between Item 2 on the Triple E Rubric (Engage 2) and Standard IIIb from McREL. There was a moderate, positive correlation between the two variables, $r = .594, n = 40, p < .001$ with an effect size of $r^2 = .35$. The results show moderate evidence and is statistically significant for concurrent validity (Salkind, 2010).

Triple E Rubric Engage 3

The results from Variable 3 from the Triple E Rubric, (Engage 3), “The technology causes a shift in behavior of the students, where they move from passive to active social learning. (co-use)” (Kolb, 2017, p. 85) and McREL Standard IVf, “Teachers help students work in teams and develop leadership qualities” (MCREL, 2013 p. 20) was calculated using Spearman’s rank order correlation and showed a moderate positive relationship between Engage 3 and Standard IVf, $r_s = .563, p < .001$ which is statistically significant. A Pearson product moment correlation coefficient was computed to measure the relationship between Item 3 on the Triple E Rubric (Engage 3) and Standard IVf from McREL. There was a moderate positive statistically significant correlation between the two variables, $r = .578, n = 40, p < .001$ and an effect size of
The results show moderate evidence and is statistically significant for concurrent validity and effectiveness among two variables (Salkind, 2010).

Figure 3. Engage Spearman and Pearson results.

**Triple E Rubric Enhance 1**

Variable 4 from the Triple E Rubric, (Enhance 1), “The technology tool allows student to develop a more sophisticated understand of the learning goals or content. (higher-order thinking skills)” (Kolb, 2017, p. 85) was compared to McREL Standard IVe, “Teachers help students develop critical thinking and problem-solving skills.” (MCREL, 2013 p. 20). Spearman’s rank order correlation was calculated and showed a moderate positive significant relationship between Enhance 1 and Standard IVe, $r_s = .567, p < .001$. A Pearson product moment correlation coefficient was computed to measure the relationship between Item 4 on the Triple E Rubric (Enhance 1) and Standard IVe from McREL. There was a moderate positive correlation between the two variables, $r = .552, n = 40, p < .001$ and an effect size of $r^2 = .30$. The results show moderate evidence and is statistically significant for concurrent validity and effectiveness between the two variables (Salkind, 2010).
Triple E Rubric Enhance 2

Variable 5 from the Triple E Rubric, (Enhance 2), “The technology creates supports (scaffolds) to make it easier to understand concepts or ideas.” (Kolb, 2017, p. 85), was compared to MCREL Standard IVc, “Teachers use a variety of instructional methods.” (MCREL, 2013 p. 19) Spearman’s rank order correlation was calculated and showed a very strong statistically significant positive relationship between Enhance 2 and Standard IVc, $r_s = .849, p < .001$. A Pearson product moment correlation coefficient was computed to measure the relationship between Item 5 on the Triple E Rubric (Enhance 2) and Standard IVc from McREL. There was a very strong positive correlation between the two variables, $r = .807, n = 40, p < .001$ and an effect size of $r^2 = .65$. The results show very strong evidence and is statistically significant for concurrent validity and effectiveness among the two variables (Salkind, 2010).

Triple E Rubric Enhance 3

Variable 6 from the Triple E Rubric, (Enhance 3), “The technology creates paths for students to demonstrate their understanding of the learning goals in a way that they could not do with traditional tools.” (Kolb, 2017, p. 85) was compared to McREL, Standard IVd, “Teachers integrate and utilize technology in their instruction.” (MCREL, 2013 p. 20). Spearman’s rank order correlation and showed a very strong statistically significant positive relationship between Enhance 2 and Standard IVd, $r_s = .860, p < .001$. A Pearson product moment correlation coefficient was computed to measure the relationship between Item 6 on the Triple E Rubric (Enhance 3) and Standard IVd from McREL. There was a very strong positive correlation between the two variables, $r = .824, n = 40, p < .001$ and an effect size of $r^2 = .67$. The results
indicate very strong evidence and is statistically significant for concurrent validity and
effectiveness among two variables (Salkind, 2010).

![Enhance Spearman and Pearson results](image)

*Figure 4. Enhance Spearman and Pearson results.*

**Triple E Rubric Extend 1**

Variable 7 from the Triple E Rubric, (Extend 1) “The technology creates opportunities for students to learn outside of their typical school day.” (Kolb, 2017, p. 85) was compared to McREL Standard IIIa, “Teachers align their instruction with the state standards” (McREL, 2013 p. 20) using Spearman’s rank order correlation. A moderate statistically significant positive relationship was obtained between Extend 1 and Standard IIIa, $r_s = .585, p < .001$. A Pearson product moment correlation coefficient was computed to measure the relationship between Item 7 on the Triple E Rubric (Extend 1) and Standard IIIa from McREL. There was a strong positive correlation between the two variables, $r = .573, n = 40, p < .001$ and an effect size of $r^2 = .32$. The results show moderate evidence and is statistically significant for concurrent validity and effectiveness among two variables (Salkind, 2010).
Triple E Rubric Extend 2

Variable 8 from the Triple E Rubric, (Extend 2) “The technology creates a bridge between students’ school learning and their every life experience.” (Kolb, 2017, p. 85) was compared to MCREL Standard IIIc, “Teachers recognize the interconnectedness of content areas/disciplines. Teachers know the links and vertical alignment of the grade or subject they teach.” (MCREL, 2013 p. 18) Spearman’s rank order correlation indicated a statistically significant strong positive relationship between Extend 2 and Standard IIIc, \( r_s = .661, p < .001 \). A Pearson product moment correlation coefficient was computed to measure the relationship between Item 8 on the Triple E Rubric (Extend 2) and Standard IIIc from McREL. There was a strong positive correlation between the two variables, \( r = .632, n = 40, p < .001 \) and an effect size of \( r^2 = .40 \). The results show strong evidence and is statistically significant for concurrent validity and effectiveness among two variables (Salkind, 2010).

Triple E Rubric Extend 3

Variable 9 from the Triple E Rubric, (Extend 3), “The technology allows the students to develop skills that they can use in their everyday lives.” (Kolb, 2017, p. 85), was compared to McREL Standard IIIId, “Teachers make instruction relevant to students” (MCREL, 2013 p. 18). Spearman’s rank order correlation indicated a statistically significant very strong positive relationship between Extend 3 and Standard IIIId, \( r_s = .845, p < .001 \). A Pearson product moment correlation coefficient was computed to measure the relationship between Item 9 on the Triple E Rubric (Extend 2) and Standard IIIId from McREL. There was a very strong positive correlation between the two variables, \( r = .844, n = 40, p < .001 \) and an effect size of \( r^2 = .71 \). The results
show very strong evidence and is statistically significant for concurrent validity and effectiveness among the two variables (Salkind, 2010).

![Graph showing correlation results](image)

*Figure 5. Extend Spearman and Pearson results.*

This is a quantitative correlation study that focused on determining if the Triple E Rubric is a valid and reliable instrument for lesson design. This rubric was designed to assist teachers in deciding if technology tools should be used in a lesson. Content and concurrent validity were established by collecting 40 teacher lesson plans and recordings of observations of 40 teachers teaching those lesson plans where technology was used. Each lesson plan was rated by two raters using the Triple E Rubric, and then the observations were rated using the validated McREL Teacher Evaluation Tool.

Content validity was established by a panel of educational experts by comparing the two instruments. A rationale matrix was created by the researcher and presented to a panel of three experts. The three experts agreed that the variables measured similar qualities. Concurrent validity values are all statistically significant in this study and range from .563 (moderate) -.860.
(very strong) for Spearman’s rho and for Pearson product moment correlation, .552 (moderate) - .844 (very strong) and effect sizes range from .30 (moderate) -.71(large). Interrater reliability among the raters indicate statistically significant values from Cohen’s $k$ are .812 (very good) for The Triple E Rubric and .781 (good) for the McREL Teacher Evaluation Rubric. The study findings suggest that the Triple E Rubric is a valid and reliable tool to be used to design authentic lessons with technology tools.
CHAPTER 5
DISCUSSION

The results from the lesson plans and observations provide strong evidence that the Triple E Rubric is a reliable and valid instrument for planning lessons with technology integration. While there were a few moderate scores for some of the nine items, the total scores of each instrument showed a high correlation for both Rater one and two. As teachers use the Triple E Rubric, they first look at the total score to decide if the technology would be the correct tool for the lesson. If the score is high the user would continue as planned, or if the score is low the user would review the key and review instructional strategies and the technology tool.

While there are many factors in determining teacher effectiveness, this study dealt specifically with lessons where technology was integrated. The premise of using the two instruments was that if the teacher scored high on the Triple E Rubric, then the teacher would score high on the McREL and vice-versa for low scores. The Triple E Rubric scores and the matching variables from the McREL Teacher Evaluation Tool demonstrated strong concurrent significance. Each of the items from the Triple E Rubric was compared with its matching item from the McREL. The correlation was calculated using Spearman’s rho and Pearson product moment correlation in IBM SPSS version 25.

The teacher lesson plans and observations were collected in the spring 2018 semester between the months of April and May. All data collection took place before the state-mandated assessment for core subjects. Of the 40 lessons, nine were dedicated to benchmark and The State of Texas Assessments of Academic Readiness (STAAR) review. The teachers were permitted to use any available technology to integrate into their lesson; however, the results showed that every lesson included student use of the iPad. Since the school district was supporting the one-to-
one initiative with iPads and there was an increased expectation to use technology tools, this may have contributed to the teachers only using the iPads as the student technology tool. Furthermore, the ease of use with the mobile device created a favorable environment for use in the classroom. On the other hand, teachers used a variety of devices for teaching. All classrooms in the district were equipped with peripheral devices such as mounted projectors, Apple TV’s, sound system with a teacher microphone, and a document camera. This equipment helped the teacher provide visuals and enhanced audio while teaching or giving instructions for projects. Thirty-five of the lessons included the use of a mounted projector connected to either the teacher iPad or the teacher computer.

Of the forty lessons, over 20 different applications (apps) for technology were used on both the student and teacher iPads. The teachers would not necessarily use the same app as the students, and in many instances, the students were permitted to pick whatever app they had available to them. Some of the most popular apps used for creation of products included Book Creator, Plotagon, iMovie, and Explain Everything. Apps for lesson delivery included the district's adoption of the Canvas learning management system (LMS), Notability, Nearpod, and Classkick. Tools for collaboration and global connectedness included online tools like Quizlet Live, Skype, and Padlet. Apps that were used for assessment involved Kahoot, Quizzes, Canvas, and Classkick. Classroom management tools played an important role in the flow of each lesson. For example, the application, Classroom by Apple, allows the teacher to view each student’s iPad from the instructor’s iPad. This tool allowed teachers to be in the power zone (close proximity to the students) instead of stationary in the front of the classroom, tethered to a computer, document camera, or wired device. Within Apple Classroom, teachers had the capability to freeze all the student screens and lock students in apps required for that class.
period. Additionally, this tool allowed the teacher to airplay a student screen to the Apple TV and projector for a quick transition between teacher iPad and student presentations.

After further review of the data, some discrepancies in scores were exposed. For example, 37 out of 40 lesson plans evaluated with the Triple E Rubric included group or partner work, supporting both collaboration and engagement. However, when looking closely at the Triple E Rubric Engage 3, “The technology causes a shift in behavior of the students, where they move from passive to active social learning. (co-use)” (Kolb, 2017, p. 85) and McREL Standard IVf, “Teachers help students work in teams and develop leadership qualities” (McREL, 2013 p. 20), at least two of the teachers indicated in the lesson plan that the students would be working in teams for the project. However, the lesson observation revealed the students working independently. This would cause a discrepancy in that the lesson would score high on the Triple E Rubric but then score low on the McREL Teacher Evaluation Rubric.

The other set of items that scored on the lower end was Item 3 from the Triple E Rubric, (Extend 1) “The technology creates opportunities for students to learn outside of their typical school day.” (Kolb, 2017, p. 85) was compared to McREL Standard IIIa, “Teachers align their instruction with the state standards” (McREL, 2013 p. 20). A more detailed description item on the McREL states, “They develop and apply strategies to make the curriculum rigorous and relevant for all students and provide a balanced curriculum that enhances literacy skills. Middle and High school teachers incorporate literacy instruction within the content area or discipline” (McREL, 2013, p. 20). The key idea in this statement is that the curriculum is rigorous and relevant for all students. Defining rigorous and relevant work for students can create confusion with the interpretation and may have caused different results between the raters.
There were some issues regarding the observations of the lessons that were taught, and the recruitment of participants. The researcher met with each teacher to set up recording equipment, but because of time constraints, the researcher had not viewed the lesson plans ahead of time. Consequently, there was no discourse about the proposed lesson and the actual teaching of the lesson before, during, or after the study. Additionally, it was difficult to recruit participants for the study. Teachers were randomly invited to participate, but some refused. Some of the refusals were due to lack of confidence with technology tools and some were due to the fact that main data collection took place in late spring, a time when teachers were stressed because they were reviewing for the STAAR.

Most of the scores from the lessons evaluated using the Triple E Rubric were high. Total scores ranged from 10-18 points. A few of the scores were low. One lesson had a total score of 10, five had a score of 12, and nine had a score of 13. The remaining twenty-five scores were 14 and above. Twenty of the total scores were a perfect 18. One reason for the high scores was that the school district had provided abundant technology resources to teachers and students, including a robust wireless network and networking infrastructure. There were instructional support coaches readily available as well as ongoing professional development on a regular basis. However, for this study, the teachers were neither coached by the researchers while writing the lesson plan, before or during the observation. The researchers did not offer suggestions of how to improve the lesson at any point during or after this study. The high scores may have impacted the study by not displaying a wider range of technology failures and not showing a true picture of what can happen in a classroom when the implications of failure are not considered. When using technology incorrectly, the technology can easily become a class disruption or hinderance.
Implications

The implications of the Triple E Rubric are that it has the potential to guide teachers to quickly plan a successful lesson with the proper technology tools and pedagogical strategies. The Triple E Rubric and framework are supported by the International Society for Technology in Education (ISTE), a well-known advocate for best practices for integrating technology into teaching and learning. Dr. Kolb’s book supports teachers in creating authentic learning opportunities with technology tools. Establishing the reliability validity of this Triple E Rubric will not only bolster the effectiveness of educators navigating pedagogy for teaching and learning but will also provide a valuable tool that assists with lesson planning. Many times, educators focus on the tool and build lessons around the tool; however, teachers and administrators should not be distracted by all the bells and whistles of the technology tool but instead, realize that there should be a focus on the learning goals and the content before any technology tool is used in the classroom. False engagement can occur when the student is engaged with the technology tool but is not engaged with content from the learning objective. This type of engagement can happen often when using technology tools. The Triple E Framework focuses on the needs of the learner rather than the technology itself. Teachers should focus on the instructional strategies in connection with the technology tool and not focus on building a lesson around the tool in isolation.

In addition to Dr. Kolb’s book, there is a website that provides information and free, open source access to the Triple E Rubric. The website contains a professional learning network for educators to submit and evaluate lessons and share with other educators: https://www.tripleeframework.com. The website offers sample lessons, case studies, and suggestions for strategical instructional methods to use in the classroom. For this study, the
teachers did not see the Triple E Rubric before they completed the lesson plan. In order to reduce bias, the teachers were not formally introduced to the Triple E Framework for the duration of the study. Contributing teachers of this study signed a consent form with a confidentiality agreement that all identifying information would not be disclosed. In an effort to maintain confidentiality, no specific details about individual lessons were revealed. However, at the conclusion of this study all teachers who participated in the study were invited to view the Triple E Framework via the website. Teachers did not see their evaluations or ratings included in this study.

Conclusion

This study provides strong evidence that the Triple E Rubric is a valid and reliable instrument for lesson design. Given the total scores inter-rater reliability using the computations from Cohen’s $k$ and the validity scores from Spearman’s rho and Pearson product moment correlation, this study indicates that teachers may benefit from using the Triple E Rubric when planning integrated technology lessons. If teachers have basic background information and understanding of the Triple E Framework and utilize the Triple E Rubric, there is evidence to support the validity and reliability of using the Triple E Rubric when designing lessons using technology. As discussed in the literature review, there is a need for improved authentic lessons with technology that will improve teacher effectiveness. The uniqueness of the Triple E Rubric offers a solution that is research based and can be a beneficial tool for all teachers when writing lesson plans. Overall, as teachers learn to create valuable lessons using technology, this can help both students and teachers use technology effectively.

Technology use for teaching and learning can increase student engagement and outcomes if planned and implemented appropriately (Nelson Laird & Kuh, 2005; Sung, Chang, & Liu,
Future research could include a study of the Triple E Rubric in a classroom setting with a control group and experimental group. Researchers could look at student engagement and lesson effectiveness through a series of observations from lessons using the Triple E Rubric. Since this study was limited to the use of iPads, some suggestions for future research could include using other tools. Given the popularity of Maker Spaces and 3D printing, future researchers could use the Triple E Framework with these varieties of popular technology. Other tools such as Chromebooks, laptops, and smartphones would be ideal tools to study using the Triple E Rubric as well.

The Triple E Framework, along with the Triple E Rubric, can assist teachers in planning effective and authentic lessons that include technology. Once familiar with the framework, teachers can ask themselves the nine questions to evaluate a proposed lesson. After rating the lesson, if the score is low, the key includes some suggestions for changing pedagogical strategies as well as providing guidance on whether the use of the technology tool is the best approach to mastering the learning outcomes. The Triple E Framework involves engagement, enhancement and extension of learning goals, and an ideal, authentic lesson will incorporate all three components. It is essential that the student is not just not engaged with the technology tool itself but is engaged in the content that supports the learning goal. As teachers plan lessons, they should be mindful of how the technology can engage students to focus on content, enhance the lesson to incorporate higher level thinking, and extend the lesson to create an authentic learning experience. This study provides evidence that the Triple E Rubric for lesson design is a valid and reliable tool for educators to design authentic lessons that include technology.
APPENDIX A

TRIPLE E RUBRIC

Reproduced with permission from Karen S. McKinley, @theELALady.
### Engagement in the Learning

<table>
<thead>
<tr>
<th>0=No</th>
<th>1=Somewhat</th>
<th>2=Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>The technology allows students to focus on the assignment or activity with less distraction. <em>(time-on-task)</em></td>
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<tr>
<td>The technology motivates students to start the learning process.</td>
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<tr>
<td>The technology causes a shift in the behavior of the students, where they move from passive to active social learners. <em>(co-use)</em></td>
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</tbody>
</table>

### Enhancement of the Learning Goals

<table>
<thead>
<tr>
<th>0=No</th>
<th>1=Somewhat</th>
<th>2=Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>The technology tool allows students to develop a more sophisticated understanding of the learning goals or content. <em>(higher-order thinking skills)</em></td>
<td></td>
<td></td>
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<tr>
<td>The technology creates supports <em>(scaffolds)</em> to make it easier to understand concepts or ideas.</td>
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<tr>
<td>The technology creates paths for students to demonstrate their understanding of the learning goals in a way that they could not do with traditional tools.</td>
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</tbody>
</table>

### Extension of the Learning Goals

<table>
<thead>
<tr>
<th>0=No</th>
<th>1=Somewhat</th>
<th>2=Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>The technology creates opportunities for students to learn outside of their typical school day.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The technology creates a bridge between students’ school learning and their everyday life experiences.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The technology allows students to develop skills that they can use in their everyday lives.</td>
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</tbody>
</table>

**“Key to point totals**

**13–18 Points (Green Light).** When a lesson has at least 13 points, it is always meeting all three components of the Framework. Therefore, these lessons tend to show remarkable connection between the technology tools, instructional choices around the tool, and students’ focus and comprehension of the learning goals. Students should be engaged as active time-on-task social learners through the technology. Students’ understanding of the learning goals should be
enhanced through the technology in ways that traditional tools could not easily do, and finally, students’ understanding of the learning goals should transcend the Classroom so that they are connecting what they are learning to their everyday lives.

**7–12 Points (Yellow Light).** When a lesson receives between 10 and 12 points, it is meeting at least two of the three levels of the Framework. By meeting at least two levels (most often engagement and enhancement, or engagement and extension), there is a strong connection between technology tools and students’ comprehension of the learning goals. When a lesson has between 7 and 9 points, the lesson is still meeting at least two levels of the Framework. However, it is not usually meeting the components at all the highest options. Thus, while there is a connection between technology and learning goals, educators should take time to reevaluate the lesson and technology choices and instructional moves to evaluate the lesson and technology choices and instructional moves to make certain that technology enhances and/or extends the learning goals in some significant way. This may be an opportunity to add more instructional moves into the lesson to better leverage the technology for student learning.

**6 Points or below (Red Light).** When a lesson has 6 points or below, the lesson is often meeting only one level of the Framework. This level is almost always engagement. Consequently, the connection between technology, instructional moves, and learning goals tends to be low. And if engagement is the only connection, the educators should reconsider whether this particular technology should be used in the lesson, if more instructional moves should be added to better leverage the technology for enhancing or extending learning, or if a more traditional method (not using technology) may be more appropriate. In particular, since technology tends to extol much time and energy to set up and implement, it should be used carefully and purposefully.” (P.87)
APPENDIX B

McREL TEACHER EVALUATION RUBRIC

Reproduced with permission from McREL International.
TEACHER EVALUATION RUBRIC

This form should be used for the teacher self-assessment, classroom observation, and the summary evaluation conference.

Note: A "✓" in the first column (Observation) means that the evaluator should be able to observe the items in that row during routine classroom observations.

Name: ___________________________ Date: ___________________________

School: ___________________________ District: ___________________________

Evaluator: _________________________ Title: _____________________________

Start Time: _________________________ End Time: _________________________

STANDARD I: TEACHERS DEMONSTRATE LEADERSHIP

<table>
<thead>
<tr>
<th>Observation</th>
<th>DEVELOPED</th>
<th>PROGRESSIVE</th>
<th>ACCOMPLISHED</th>
<th>DISTINGUISHED</th>
<th>NOT DEMONSTRATED (COMMENT REQUIRED)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Teachers lead in their classrooms. Teachers demonstrate leadership by taking responsibility for the progress of all students to ensure that they graduate from high school, are globally competitive for work and postsecondary education, and are prepared for life in the 21st century. Teachers communicate their vision to their students. Using a variety of data sources, they analyze, plan, and set long and short goals that meet the needs of the individual student and the class. Teachers use various types of assessment data during the school year to evaluate student progress and make adjustments to the teaching and learning process. They establish a safe, orderly environment and create a culture that empowers students to collaborate and become lifelong learners.</td>
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<td>✓</td>
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<tr>
<td>Understands how they contribute to students graduating from high school.</td>
<td>( \text{✓} )</td>
<td>Takes responsibility for the progress of students to ensure that they graduate from high school.</td>
<td>( \text{✓} )</td>
<td>Communicates to students the value of being prepared for life in the 21st century.</td>
<td>( \text{✓} )</td>
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<tr>
<td>Uses data to understand the skills and abilities of students.</td>
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<tr>
<td>Establishes a safe and orderly classroom.</td>
<td>( \text{✓} )</td>
<td>Creates a classroom culture that empowers students to collaborate.</td>
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</table>

b. Teachers demonstrate leadership in the school. Teachers work collaboratively with school personnel to create a professional learning community. They analyze and use local, state, and national data to develop goals and strategies in the school improvement plan that enhance student learning and teacher effectiveness. Teachers provide input in determining the school budget and in the selection of professional development that meets the needs of students and their own professional growth. They participate in the hiring process and collaborate with their colleagues to mentor and support teachers to improve the effectiveness of their departments or grade levels.

<table>
<thead>
<tr>
<th>Observation</th>
<th>DEVELOPED</th>
<th>PROGRESSIVE</th>
<th>ACCOMPLISHED</th>
<th>DISTINGUISHED</th>
<th>NOT DEMONSTRATED (COMMENT REQUIRED)</th>
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<tr>
<td>Attends professional learning community meetings.</td>
<td>( \text{✓} )</td>
<td>Participates in professional learning community.</td>
<td>( \text{✓} )</td>
<td>Assumes a leadership role in professional learning community.</td>
<td>( \text{✓} )</td>
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<tr>
<td>Displays awareness of the goals of the school improvement plan.</td>
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<td>Participates in developing and implementing the school improvement plan.</td>
<td>( \text{✓} )</td>
<td>Collaborates with school personnel on school improvement activities.</td>
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<td>Observation</td>
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<tr>
<td><strong>c. Teachers lead the teaching profession.</strong> Teachers strive to improve the teaching profession. They contribute to the establishment of positive working conditions in their school. They actively participate in and advocate for decision-making structures in education and government that take advantage of the expertise of teachers. Teachers promote professional growth for all educators and collaborate with their colleagues to improve the profession.</td>
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<tr>
<td><strong>Observation</strong></td>
<td><strong>Developing</strong></td>
<td><strong>Proficient</strong></td>
<td><strong>Accomplished</strong></td>
<td><strong>Distinguished</strong></td>
<td><strong>Not Demonstrated</strong></td>
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<td></td>
<td>less knowledge of opportunities and the need for professional growth and begins to establish relationships with colleagues.</td>
<td>contributes to the improvement of the profession through professional growth.</td>
<td>promotes positive working relationships.</td>
<td>School’s decision-making processes as required.</td>
<td>seized opportunities to lead professional growth activities and decision-making processes.</td>
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<td></td>
<td>knows about the policies and practices affecting student learning.</td>
<td>supports positive change in policies and practices affecting student learning.</td>
<td>participates in developing policies and practices to improve student learning.</td>
<td>actively participates, promotes, and provides strong supporting evidence for implementation of initiatives to improve education.</td>
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<tr>
<td></td>
<td>understands the importance of ethical behavior.</td>
<td>demonstrates ethical behavior.</td>
<td>knows and upholds ethical principles.</td>
<td>models ethical behavior and encourages others to do the same.</td>
<td></td>
</tr>
</tbody>
</table>

**Comments**
### Examples of Artifacts for Standard I:

- Lesson plans
- Journals
- Student handbooks
- Student work
- School improvement planning
- Service on committees
- Relevant data
- Class rules and procedures
- Participation in Professional Learning Community
- Membership in professional organizations
- Formal and informal mentoring
- Surveys
- National Board Certification
- Discipline records
- School Improvement Team membership

### Standard II: Teachers Establish a Respectful Environment for a Diverse Population of Students

**a. Teachers provide an environment in which each child has a positive, nurturing relationship with caring adults. Teachers encourage an environment that is inviting, respectful, supportive, inclusive, and flexible.**

<table>
<thead>
<tr>
<th>Observation</th>
<th>Developing</th>
<th>Proficient</th>
<th>Accomplished</th>
<th>Distinguished</th>
<th>Not Demonstrated (Comment Required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔</td>
<td>Appreciates and understands the need to establish nurturing relationships.</td>
<td>... and establishes an inviting, respectful, inclusive, flexible, and supportive learning environment.</td>
<td>... and maintains a positive and nurturing learning environment.</td>
<td>... and encourages and advises others to provide a nurturing and positive learning environment for all students.</td>
<td></td>
</tr>
</tbody>
</table>

**b. Teachers embrace diversity in the school community and in the world. Teachers demonstrate their knowledge of the history of diverse cultures and their role in shaping global issues. They actively select materials and develop lessons that counteract stereotypes and incorporate histories and contributions of all cultures. Teachers recognize the influence of race, ethnicity, gender, religion, and other aspects of culture on a student's development and personality. Teachers strive to understand how a student's culture and background may influence his or her school performance. Teachers consider and incorporate different points of view in their instruction.**

| ✔ | Acknowledges that diverse cultures impact the world. | ... and displays knowledge of diverse cultures, their histories, and their roles in shaping global issues. | ... and uses materials or lessons that counteract stereotypes and acknowledges the contributions of all cultures. | ... and promotes a deep understanding of cultures through the integration of naturally sensitive materials and ideas throughout the curriculum. | |
| ✔ | Demonstrates awareness of the diversity of students in the classroom. | ... and acknowledges the influence of race, ethnicity, gender, religion, socio-economics, and culture on a student's development and attitudes. | ... and consistently incorporates different points of view in instruction. | ... and capitalizes on diversity as an asset in the classroom. | |

**c. Teachers treat students as individuals. Teachers maintain high expectations, including graduation from high school for students of all backgrounds. Teachers appreciate the differences and value the contributions of each student in the learning environment by building positive, appropriate relationships.**

| ✔ | Holds high expectations of students. | ... and communicates high expectations for all students. | ... and encourages and values contributions of students, regardless of background or ability. | ... and helps students hold high expectations for themselves and their peers. | |

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58
d. Teachers adapt their teaching for the benefit of students with special needs. Teachers collaborate with the range of support specialists to help meet the special needs of all students. Through inclusive and other models of effective practice, teachers engage students to ensure that their needs are met.

<table>
<thead>
<tr>
<th>Observation</th>
<th>Developing</th>
<th>Prominent</th>
<th>Accomplished</th>
<th>Distinguished</th>
<th>Not Demonstrated (Comment Required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔</td>
<td>Recognizes that students have a variety of learning needs.</td>
<td>... and</td>
<td>Collaborates with specialists who can support the special learning needs of students.</td>
<td>... and</td>
<td>Understands the roles of and collaborates with the full range of support specialists to help meet the special needs of all students.</td>
</tr>
<tr>
<td>✔</td>
<td>Is knowledgeable of effective practices for students with special needs.</td>
<td>... and</td>
<td>Provides unique learning opportunities, such as inclusion and research-based, effective practices, for students with special needs.</td>
<td>... and</td>
<td>Effectively engages special needs students in learning activities and ensures their unique learning needs are met.</td>
</tr>
<tr>
<td>✔</td>
<td>Anticipates the unique learning needs of students and solicits assistance from within and outside the school to address those needs.</td>
<td>... and</td>
<td></td>
<td>... and</td>
<td>Adapts instruction for the benefit of students with special needs and helps colleagues do the same for their students.</td>
</tr>
</tbody>
</table>

e. Teachers work collaboratively with the families and significant adults in the lives of their students. Teachers recognize that educating children in a shared responsibility involving the school, parents or guardians, and the community. Teachers improve communication and collaboration between the school and the home and community in order to promote trust and understanding and build partnerships with all segments of the school community. Teachers seek solutions to overcome cultural and socioeconomic obstacles that may stand in the way of effective family and community involvement in the education of their students.

<table>
<thead>
<tr>
<th>Observation</th>
<th>Developing</th>
<th>Prominent</th>
<th>Accomplished</th>
<th>Distinguished</th>
<th>Not Demonstrated (Comment Required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔</td>
<td>Responds to family and community concerns.</td>
<td>... and</td>
<td>Communicates and collaborates with the home and community for the benefit of students.</td>
<td>... and</td>
<td>Recognizes obstacles to family and community participation and conscientiously seeks solutions to overcome them.</td>
</tr>
<tr>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td>... and</td>
<td>Promotes trust and understanding throughout the school community.</td>
</tr>
</tbody>
</table>

Comments

EXAMPLES OF ARTIFACTS FOR STANDARD 11:

- Cooperation with ESL teachers
- Lesson plans that integrate international content
- Lesson plans that support modifications included in student IEPs
- Documentation of referral and use of IEPs
- Communications with parents/community
- Professional development on cultural attitudes and awareness
- Use of technology to incorporate cultural awareness into lessons
- Student profiles
- Student surveys
## Standard III: Teachers know the content they teach

**a. Teachers align their instruction with the state standards.** In order to enhance the state standards, teachers investigate the content standards developed by professional organizations in their specialty area. They develop and apply strategies to make the curriculum rigorous and relevant for all students and provide a balanced curriculum that enhances literacy skills. Elementary teachers have explicit and thorough preparation in literacy instruction. Middle and high school teachers incorporate literacy instruction within the content area or discipline.

<table>
<thead>
<tr>
<th>Observation</th>
<th>Developing</th>
<th>Proficient</th>
<th>Accomplished</th>
<th>Distinguished</th>
<th>Not Demonstrated (Comment Required)</th>
</tr>
</thead>
</table>

- **... and** Demonstrates an awareness of the state standards and references them in the preparation of lesson plans.
- **... and** Understands the state standards, uses them in preparation of lesson plans, and applies strategies to make the curriculum rigorous and relevant.
- **... and** Develops and applies strategies based on the state standards and standards developed by professional organizations to make the curriculum balanced, rigorous and relevant.
- **... and** Assists colleagues in applying such strategies in their classrooms.

- **Elementary:** Begins to integrate literacy instruction in selected lessons.
- **Secondary:** Recognizes the importance of integrating literacy strategies within the content areas.
- **Elementary:** Integrates effective literacy instruction throughout the curriculum.
- **Secondary:** Incorporates a wide variety of literacy skills within content areas to enhance learning.
- **Elementary:** Evaluates and reflects upon the effectiveness of instruction.
- **Secondary:** Evaluates and reflects upon the effectiveness of instruction within content areas.
- **Elementary:** Makes necessary changes to instructional practice to improve student learning.
- **Secondary:** Makes necessary changes to instructional practice to improve student learning.

**b. Teachers know the content appropriate to their teaching specialty.** Teachers bring a richness and depth of understanding to their classrooms by knowing their subjects beyond the content they are expected to teach and by directing students’ natural curiosity toward learning. Elementary teachers have broad knowledge across disciplines. Middle school and high school teachers have depth in one or more specific content areas or disciplines.

- **... and** Demonstrates a basic level of content knowledge in the teaching specialty to which assigned.
- **... and** Demonstrates an appropriate level of content knowledge in the teaching specialty to which assigned.
- **... and** Applies knowledge of subject beyond the content in assigned teaching specialty. Motivates students to investigate the content area to expand their knowledge and satisfy their natural curiosity.
- **... and** Extends knowledge of subject beyond content in their teaching specialty and sparks students’ curiosity for learning beyond the required course work.

17
<table>
<thead>
<tr>
<th>Observation</th>
<th>Developing</th>
<th>Proficient</th>
<th>Accomplished</th>
<th>Distinguished</th>
<th>Not Demonstrated (Comment Required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>c. Teachers recognize the interconnectedness of content areas/disciplines. Teachers know the links and vertical alignment of the grade or subject they teach. Teachers understand how the content they teach relates to other disciplines in order to deepen understanding and connect learning for students. Teachers promote global awareness and its relevance to subjects they teach.</td>
<td>![Checkmark]</td>
<td>![Checkmark]</td>
<td>![Checkmark]</td>
<td>![Checkmark]</td>
<td>![Checkmark]</td>
</tr>
<tr>
<td>- Understands the links between grade/subject and the state standards.</td>
<td>![Checkmark]</td>
<td>![Checkmark]</td>
<td>![Checkmark]</td>
<td>![Checkmark]</td>
<td>![Checkmark]</td>
</tr>
<tr>
<td>- Displays global awareness.</td>
<td>![Checkmark]</td>
<td>![Checkmark]</td>
<td>![Checkmark]</td>
<td>![Checkmark]</td>
<td>![Checkmark]</td>
</tr>
<tr>
<td>d. Teachers make instruction relevant to students. Teachers incorporate 21st-century skills deliberately, strategically, and broadly into their teaching. These skills include leadership, ethics, accountability, adaptability, personal productivity, personal responsibility, people skills, self-direction, and social responsibility. Teachers help their students understand the relationship between the state standards and 21st-century content, which includes global awareness, financial, economic, business, and entrepreneurial literacy, civic literacy, and health awareness.</td>
<td>![Checkmark]</td>
<td>![Checkmark]</td>
<td>![Checkmark]</td>
<td>![Checkmark]</td>
<td>![Checkmark]</td>
</tr>
<tr>
<td>- Identifies relationships between the state standards and life in the 21st century.</td>
<td>![Checkmark]</td>
<td>![Checkmark]</td>
<td>![Checkmark]</td>
<td>![Checkmark]</td>
<td>![Checkmark]</td>
</tr>
</tbody>
</table>

**Comments**

**Examples of Artifacts for Standard III:**

- Display of creative student work
- Lesson plans
- Content standards
### Standard IV: Teachers Facilitate Learning for Their Students

#### a. Teachers know the ways in which learning takes place, and they know the appropriate levels of intellectual, physical, social, and emotional development of their students. Teachers know how students think and learn. Teachers understand the influences that affect individual student learning (development, culture, language proficiency, etc.) and differentiate their instruction accordingly. Teachers keep abreast of evolving research about student learning. They adapt resources to address the strengths and weaknesses of their students.

<table>
<thead>
<tr>
<th>Observation</th>
<th>Developing</th>
<th>Proficient</th>
<th>Accomplished</th>
<th>Distinguished</th>
<th>Not Demonstrated (Comment Required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ Understands developmental levels of students and recognizes the need to differentiate instruction.</td>
<td>☑ Understands developmental levels of students and appropriately differentiates instruction.</td>
<td>☑ Identifies appropriate developmental levels of students and consistently and appropriately differentiates instruction.</td>
<td>☑ Encourages and guides colleagues to adopt instruction to align with students’ developmental levels.</td>
<td>☑ Stays abreast of current research about student learning and emerging resources and encourages the school to adopt or adapt them for the benefit of all students.</td>
<td></td>
</tr>
<tr>
<td>☑ Assesses resources needed to address strengths and weaknesses of students.</td>
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</tbody>
</table>

#### b. Teachers plan instruction appropriate for their students. Teachers collaborate with their colleagues and use a variety of data sources for short- and long-range planning based on state standards. These plans reflect an understanding of how students learn. Teachers engage students in the learning process. They understand that instructional plans must be continually monitored and modified to enhance learning. Teachers make the curriculum responsive to cultural differences and individual learning needs.

<table>
<thead>
<tr>
<th>Observation</th>
<th>Developing</th>
<th>Proficient</th>
<th>Accomplished</th>
<th>Distinguished</th>
<th>Not Demonstrated (Comment Required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ Recognizes data sources important to planning instruction.</td>
<td>☑ Uses a variety of data for short- and long-range planning of instruction.</td>
<td>☑ Monitors student performance and responds to individual learning needs in order to engage students in learning.</td>
<td>☑ Monitors student performance and responds to cultural diversity and learning needs through the school improvement process.</td>
<td>☑ Stays abreast of emerging research areas and new and innovative materials and incorporates them into lesson plans and instructional strategies.</td>
<td></td>
</tr>
<tr>
<td>☑ Recognizes data sources important to planning instruction.</td>
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</tbody>
</table>

#### c. Teachers use a variety of instructional methods. Teachers choose the methods and techniques that are most effective in meeting the needs of their students as they strive to eliminate achievement gaps. Teachers employ a wide range of techniques including instructional technology, learning styles, and differentiated instruction.

<table>
<thead>
<tr>
<th>Observation</th>
<th>Developing</th>
<th>Proficient</th>
<th>Accomplished</th>
<th>Distinguished</th>
<th>Not Demonstrated (Comment Required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ Demonstrates awareness of the variety of methods and materials necessary to meet the needs of all students.</td>
<td>☑ Demonstrates awareness or use of appropriate methods and materials necessary to meet the needs of all students.</td>
<td>☑ Ensures the success of all students through the selection and utilization of appropriate methods and materials.</td>
<td>☑ Stays abreast of emerging research areas and new and innovative materials and incorporates them into lesson plans and instructional strategies.</td>
<td>☑</td>
<td></td>
</tr>
<tr>
<td>Observation</td>
<td>DEVELOPING</td>
<td>PROFICIENT</td>
<td>ACCOMPLISHED</td>
<td>DISTINGUISHED</td>
<td>NOT DEMONSTRATED (COMMENT REQUIRED)</td>
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<tr>
<td>d. Teachers integrate and utilize technology in their instruction. Teachers know when and how to use technology to maximize student learning. Teachers help students use technology to learn content, think critically, solve problems, disseminate information, communicate, innovate, and collaborate.</td>
<td>✅</td>
<td>And...</td>
<td>And...</td>
<td>And...</td>
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<tr>
<td></td>
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<td>Assesses effective types of technology to use for instruction.</td>
<td>Demonstrates knowledge of how to utilize technology in instruction.</td>
<td>Integrates technology with instruction to maximize student learning.</td>
<td>Provides evidence of student engagement in higher level thinking skills through the integration of technology.</td>
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</tr>
<tr>
<td>e. Teachers help students develop critical thinking and problem-solving skills. Teachers encourage students to ask questions, think creatively, develop and test innovative ideas, synthesize knowledge, and draw conclusions. They help students exercise and communicate sound reasoning, understand connections, make complex choices, and frame, analyze, and solve problems.</td>
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</tr>
<tr>
<td></td>
<td>✅</td>
<td>And...</td>
<td>And...</td>
<td>And...</td>
<td>Encourages and assists teachers throughout the school to integrate critical thinking and problem-solving skills into their instructional practices.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Understands the importance of developing students' critical thinking and problem-solving skills.</td>
<td>Demonstrates knowledge of processes needed to support students in acquiring critical thinking skills and problem-solving skills.</td>
<td>Teaches students the processes needed to think creatively and critically.</td>
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<td></td>
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<td></td>
<td>Develop and test innovative ideas.</td>
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<td></td>
<td>Synthesize knowledge.</td>
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<td></td>
<td>Draw conclusions.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Exercise and communicate sound reasoning.</td>
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<td></td>
<td>Understand connections.</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>Make complex choices.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Frame, analyze, and solve problems.</td>
</tr>
<tr>
<td>f. Teachers help students work in teams and develop leadership qualities. Teachers teach the importance of cooperation and collaboration. They organize learning teams in order to help students define roles, strengthen social ties, improve communication and collaborative skills, interact with people from different cultures and backgrounds, and develop leadership qualities.</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>✅</td>
<td>And...</td>
<td>And...</td>
<td>And...</td>
<td>Fosters the development of student leadership and teamwork skills to be used beyond the classroom.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provides opportunities for cooperation, collaboration, and leadership through student learning teams.</td>
<td>Organizes student learning teams for the purpose of developing cooperation, collaboration, and student leadership.</td>
<td>Encourages students to create and manage learning teams.</td>
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</tbody>
</table>

20
### g. Teachers communicate effectively.

Teachers communicate in ways that are clearly understood by their students. They are perceptive listeners and are able to communicate with students in a variety of ways even when language is a barrier. Teachers help students articulate thoughts and ideas clearly and effectively.

<table>
<thead>
<tr>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Developing</strong></td>
</tr>
<tr>
<td>—</td>
</tr>
<tr>
<td>Demonstrate the ability to effectively communicate with students.</td>
</tr>
<tr>
<td>—</td>
</tr>
</tbody>
</table>

### h. Teachers use a variety of methods to assess what each student has learned.

Teachers use multiple indicators, including formative and summative assessments, to evaluate student progress and growth as they strive to eliminate achievement gaps. Teachers provide opportunities, methods, feedback, and tools for students to assess themselves and each other. Teachers use 21st century assessment systems to inform instruction and demonstrate evidence of students' 21st century knowledge, skills, performances, and dispositions.

<table>
<thead>
<tr>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Developing</strong></td>
</tr>
<tr>
<td>—</td>
</tr>
<tr>
<td>Use indicators to monitor and evaluate student progress.</td>
</tr>
<tr>
<td>Assesses students in the attainment of 21st century knowledge, skills, and dispositions.</td>
</tr>
</tbody>
</table>

### Comments


### Examples of Artifacts for Standard IV:

- Lesson plans
- Display of technology used
- Professional development
- Use of student learning teams
- Documentation of differentiated instruction
- Materials used to promote critical thinking and problem solving
- Collaborative lesson planning
**STANDARD V: TEACHERS REFLECT ON THEIR PRACTICE**

<table>
<thead>
<tr>
<th>Observation</th>
<th>Developing</th>
<th>Proficient</th>
<th>Accomplished</th>
<th>Distinguished</th>
<th>Not Demonstrated (Comment Required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Recognizes the need to improve student learning in the classroom.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ Provides ideas about what can be done to improve student learning in their classroom.</td>
<td>□ Thinks systematically and critically about learning in their classroom.</td>
<td>□ Provides a detailed analysis about what can be done to improve student learning and uses such analyses to adapt instructional practices and materials within the classroom and at the school level.</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

b. **Teachers link professional growth to their professional goals.** Teachers participate in continued, high-quality professional development that reflects a global view of educational processes, includes 21st century skills and knowledge, aligns with the State Board of Education priorities, and meets the needs of students and their own professional growth.

<table>
<thead>
<tr>
<th>Observation</th>
<th>Developing</th>
<th>Proficient</th>
<th>Accomplished</th>
<th>Distinguished</th>
<th>Not Demonstrated (Comment Required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Understands the importance of professional development.</td>
<td>□ Participates in professional development aligned with professional goals.</td>
<td>□ Participates in professional development activities aligned with goals and student needs.</td>
<td>□ Applies and implements knowledge and skills attained from professional development consistent with its intent.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

c. **Teachers function effectively in a complex, dynamic environment.** Understanding that change is constant, teachers actively investigate and consider new ideas that improve teaching and learning. They adapt their practice based on research and data to best meet the needs of their students.

<table>
<thead>
<tr>
<th>Observation</th>
<th>Developing</th>
<th>Proficient</th>
<th>Accomplished</th>
<th>Distinguished</th>
<th>Not Demonstrated (Comment Required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Is knowledgeable of current research-based approaches to teaching and learning.</td>
<td>□ Considers and uses a variety of research-based approaches to improve teaching and learning.</td>
<td>□ Actively investigates and considers alternative research-based approaches to improve teaching and learning and uses such approaches as appropriate.</td>
<td>□ Adapts professional practice based on ideas and evaluates impact on student learning.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments**

**EXAMPLES OF ARTIFACTS FOR STANDARD V:**

- Lesson plans
- Formative assessments
- Student work
- Professional Development Plan
- Completion of professional development
- Participation in Professional Learning
- Community
- Formative and summative student assessment data
APPENDIX C

RATIONALE MATRIX: TRIPLE E AND McREL

Reproduced with permission from Karen S. McKinley (@theELALady) and McREL International.
The following matrix compares the nine elements on the Triple E Rubric with selected elements of the McREL Teacher Evaluation System

| Triple E Rubric for Lesson Design Measurement Tool | McREL Teacher Evaluation Observation Tool Standards include: 
Standard III a, b, c, d - Teachers know the content they teach  
Standard IV a, c, e, d, f - Teachers facilitate learning for the students |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Engagement in the learning</strong></td>
<td>Developing</td>
</tr>
<tr>
<td><strong>Variable one Engage 1</strong></td>
<td></td>
</tr>
<tr>
<td>The technology allows students to focus on the assignment/activity/goals with less distraction (Time on Task).</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>Somewhat</td>
</tr>
<tr>
<td><strong>Variable two Engage 2</strong></td>
<td></td>
</tr>
<tr>
<td>The technology motivates students to start the learning process</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>Somewhat</td>
</tr>
<tr>
<td><strong>Variable three Engage 3</strong></td>
<td></td>
</tr>
<tr>
<td>The technology causes a shift in the behavior of the students, where they move from passive to active social learners. (through co-use or co-engagement)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>Somewhat</td>
</tr>
<tr>
<td>No</td>
<td>Somewhat</td>
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</tr>
</tbody>
</table>

**Enhancement of the learning goals**

**Variable four Enhance 1**
The technology tool allows students to develop a more sophisticated understanding of the learning goals or content.
(Using higher-order thinking skills)

**Standard IVe Teachers help students develop critical thinking and problem-solving skills.** Teachers encourage students to ask questions, think creatively, develop and test innovative ideas, synthesize knowledge, and draw conclusions. They help students exercise and communicate sound reasoning; understand connections; make complex choices; and frame, analyze, and solve problems.

<table>
<thead>
<tr>
<th>No</th>
<th>Somewhat</th>
<th>Yes</th>
<th>Understands the importance of developing students’ critical thinking and problem-solving skills</th>
<th>Demonstrates knowledge of processes needed to support students in acquiring critical thinking skills and problem-solving skills</th>
<th>Teaches students the processes needed to Think creatively and critically. Develop and test innovative ideas. Synthesize knowledge. Draw conclusions. Exercise and communicate sound reasoning. Understand connections. Make complex choices. Frame, analyze, and solve problems.</th>
<th>Encourages and assists teachers throughout the school to integrate critical thinking and problem-solving skills into their instructional practices</th>
</tr>
</thead>
</table>

**Variable five Enhance 2**
The technology creates supports (scaffolds) to make it easier to understand concepts or ideas.

**Standard IVc Teachers use a variety of instructional methods.** Teachers choose the methods and techniques that are most effective in meeting the needs of their students as they strive to eliminate achievement gaps. Teachers employ a wide range of techniques including information and communication technology, learning styles, and differentiated instruction.

<table>
<thead>
<tr>
<th>No</th>
<th>Somewhat</th>
<th>Yes</th>
<th>Demonstrates awareness of the variety of methods and materials necessary to meet the needs of all students.</th>
<th>Demonstrates awareness or use of appropriate methods and materials necessary to meet the needs of all students</th>
<th>Ensures the success of all students through the selection and utilization of appropriate methods and materials.</th>
<th>Stays abreast of emerging research areas and new and innovative materials and incorporates them into lesson plans</th>
</tr>
</thead>
</table>
Variable five Enhance 3
The technology creates paths for students to demonstrate their understanding of the learning goals in a way that they could not do with traditional tools.

<table>
<thead>
<tr>
<th>No</th>
<th>Somewhat</th>
<th>Yes</th>
</tr>
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<tbody>
<tr>
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</tbody>
</table>

**Standard IVd. Teachers integrate and utilize technology in their instruction.** Teachers know when and how to use technology to maximize student learning. Teachers help students use technology to learn content, think critically, solve problems, discern reliability, use information, communicate, innovate, and collaborate.

<table>
<thead>
<tr>
<th>Assesses effective types of technology to use for instruction.</th>
<th>Demonstrates Knowledge of how to utilize technology in instruction.</th>
<th>Integrates technology with instruction to maximize student learning.</th>
<th>Provides evidence of student engagement in higher level thinking skills through the integration of technology.</th>
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</table>

Extending the learning goals

**Variable seven Extend 1**
The technology creates opportunities for students to learn outside of their typical school day.

<table>
<thead>
<tr>
<th>No</th>
<th>Somewhat</th>
<th>Yes</th>
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**Standard IIIa Teachers align their instruction with the state standards**
In order to enhance the state standards, teachers investigate the content standards developed by professional organizations in their specialty area. They develop and apply strategies to make the curriculum rigorous and relevant for all students and provide a balanced curriculum that enhances literacy skills. Middle and High school teachers incorporate literacy instruction within the content area or discipline.

<table>
<thead>
<tr>
<th>Recognized the importance of integrating literacy strategies within the content areas.</th>
<th>Incorporates a wide variety of literacy skills within content area to enhance learning.</th>
<th>Evaluates and reflects upon the effectiveness of instruction within content areas.</th>
<th>Makes necessary changes to instructional practice to improve student learning.</th>
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**Variable eight Extend 2**
The technology creates a bridge between students school learning and their everyday life experiences.

<table>
<thead>
<tr>
<th>No</th>
<th>Somewhat</th>
<th>Yes</th>
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**Standard IIIc Teachers recognize the interconnectedness of content areas/disciplines. Teachers know the links and vertical alignment of the grade or subject they teach.** Teachers understand how the content they teach relates to other disciplines in order to deepen understanding and connect learning for students. Teachers promote global awareness and its relevance to subjects they teach.

<table>
<thead>
<tr>
<th>Understands the links between grade/subject and the state standards. Displays global awareness.</th>
<th>Demonstrates knowledge of links between grade/subject and the state standards. Promotes global awareness and its relevance to the subjects.</th>
<th>Demonstrates knowledge of the links and vertical alignment of the grade or subject area and the state standards. Relates content to other disciplines. Integrates global awareness activities throughout</th>
<th>Promotes global awareness and its reliance to all faculty member influencing curriculum and teaching practices through the school.</th>
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<tr>
<td>Variable nine Extend 3</td>
<td>Standard III. Teachers make instruction relevant to students.</td>
<td>The technology allows students to build skills, that they can use in their everyday lives.</td>
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<tr>
<td></td>
<td>The technology allows students to build skills, that they can use in their everyday lives.</td>
<td>Teachers incorporate 21st-century life skills into their teaching deliberately, strategically, and broadly. These skills include leadership, ethics, accountability, adaptability, personal productivity, personal responsibility, people skills, self-direction, and social responsibility. Teachers help their students understand the relationship between the state standards and 21st-century content, which includes global awareness; financial, economic, business and entrepreneurial literacy; civic literacy; health awareness; and environmental literacy.</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>Somewhat</td>
<td>Yes</td>
<td></td>
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<tr>
<td></td>
<td>Identifies relationships between the state standards and life in the 21st century.</td>
<td>Identifies relationships between the core content and 21st-century content.</td>
<td></td>
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<tr>
<td></td>
<td>Integrates core content and 21st-century content throughout lesson plans and classroom instructional practices.</td>
<td>Deepens students’ understanding of 21st-century skills and helps them make their own connections and develop new skills.</td>
<td></td>
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</table>
APPENDIX D

CONSENT AND ASSENT FORMS
Title of Study: A validation study of the Triple E Rubric for Lesson Design: a measurement tool for technology use in the classroom

Investigator: Sheila E. Schatzke, University of North Texas (UNT) Department of Learning Technologies, [Redacted]

Supervising Investigator: [Redacted]

Assistant researchers: Marla Chandler, Rachelle Corry, Kelly Grigg, and Leslie Kilbourn, Deer Park ISD Department of Instructional Technology

Purpose of the Study: This validation study will examine the Triple E Rubric for Lesson Design to measure the effectiveness of a lesson when using technology to support learning goals. This study will measure the content and concurrent validity of the Triple E Rubric. This study of the Triple E Rubric for Lesson Design will contribute to the ability of K-12 teachers to determine if the proposed integrated technology tool will improve the effectiveness of lessons to meet learning goals.

Study Procedures: Teachers who agree to participate will submit an electronic technology-integrated lesson plan template and agree to a classroom observation of the lesson. The observation will be administered via digital recording; all equipment and materials needed for the recording will be provided by the researcher. The researcher will then analyze the data from the written lesson and the digital recording using two instruments to validate a rubric for measuring lesson effectiveness. The total commitment of your time will be 15-30 minutes to complete the lesson plan template and a 15 minute follow-up meeting to review the lesson plan and set up the recording equipment. The teacher may assist the researcher in the collection of student consent forms, and lastly, the teacher will start and stop the digital recording equipment. The researcher will collect all the equipment and secure the data for further analysis.

Foreseeable Risks: None.

Benefits to the Subjects or Others: This study may provide a tool to designing lessons with seamless technology integration. We will also learn more about classroom pedagogy to benefit the field of education.

Compensation for Participants: None

Procedures for Maintaining Confidentiality of Research Records: The confidentiality of your individual information as well as any student in the classroom will be maintained in any publications or presentations regarding this study. Only the researchers will have access to view
the videos from the recorded lesson. All recordings will be stored on a hard drive located in the possession of the lead researcher. Results from the instruments will be coded without identifying information. During the course of the video recording, the students in the class may be included in the video. A consent form will be required of all the students in the classroom. For any parent that denies their child to participate, accommodations will be made so that the student does not appear on the digital recording.

**Questions about the Study:** If you have any questions about the study, you may contact Sheila Schatzke at [sheilaschatzke@my.unt.edu](mailto:sheilaschatzke@my.unt.edu) or [sschatzke@dpisd.org](mailto:sschatzke@dpisd.org)

**Review for the Protection of Participants:** This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at [NT](mailto:untirb@unt.edu) with questions regarding the rights of research subjects.

**Research Participants’ Rights:** Your signature below indicates that you have read or have had read to you all of the above and that you confirm all of the following:

- Sheila Schatzke has explained the study to you and answered all of your questions. You have been told the possible benefits and the potential risks and/or discomforts of the study.
- You understand that you do not have to take part in this study, and your refusal to participate or your decision to withdraw will involve no penalty or loss of rights or benefits. The study personnel may choose to stop your participation at any time.
- You understand why the study is being conducted and how it will be performed.
- You understand your rights as a research participant and you voluntarily consent to participate in this study.
- You have been told you will receive a copy of this form.

______________________________
Printed Name of Participant

______________________________  ____________
Signature of Participant                                      Date

**For the Investigator or Designee:**

I certify that I have reviewed the contents of this form with the subject signing above. I have explained the possible benefits and the potential risks and/or discomforts of the study. It is my opinion that the participant understood the explanation.

______________________________  ____________
Signature of Investigator or Designee                                      Date
University of North Texas Institutional Review Board
Informed Consent Form Parent and Student

Before agreeing to your child’s participation in this research study, it is important that you read and understand the following explanation of the purpose, benefits and risks of the study, and how it will be conducted.

**Title of Study:** A validation study of the Triple E Rubric for Lesson Design: a measurement tool for technology use in the classroom

**Investigator:** Sheila E. Schatzke, University of North Texas (UNT) Department of Learning Technologies, [sheilaschatzke@my.unt.edu](mailto:sheilaschatzke@my.unt.edu)

**Supervising Investigator:** Dr. Cathie Norris, University of North Texas (UNT).

**Purpose of the Study:** You are being asked to allow your child to participate in a research study which involves the digital recording of a teacher facilitating a lesson in the classroom. The researcher would like to gain knowledge about effective instructional strategies used in the classroom involving technology integration.

**Study Procedures:** Your child will be asked to participate in class like a normal day. The prime focus is on the teacher and the lesson. The classroom will be equipped with one camera and a microphone to video-record the teacher while teaching a lesson that includes technology. This will not take any extra time from your child’s day as the lesson will be recorded during the regular school day during regular class periods. The teacher will inform the student when he/she is recording.

**Foreseeable Risks:** No foreseeable risks are involved in this study.

**Benefits to the Subjects or Others:** This study is may not be of any immediate benefit to your child, but we hope to learn more about effective teaching strategies and lesson planning to improve your students’ future education.

**Compensation for Participants:** None.

**Procedures for Maintaining Confidentiality of Research Records:** All students who appear on the video will not be personally identified and will not be published on public websites. The confidentiality of your child’s individual information will be maintained in any publications or presentations regarding this study.

**Questions about the Study:** If you have any questions about the study, you may contact Sheila Schatzke at [sheilaschatzke@my.unt.edu](mailto:sheilaschatzke@my.unt.edu) or Dr. Cathie Norris at [cathie.norris@unt.edu](mailto:cathie.norris@unt.edu).
Review for the Protection of Participants: This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted with any questions regarding the rights of research subjects.

Research Participants’ Rights: Your signature below indicates that you have read or have had read to you all of the above and that you confirm all of the following:

- Based on this letter, you understand the study and have had an opportunity to have your questions answered by the researcher. You have been told the possible benefits and the potential risks and/or discomforts of the study.
  - You understand that you do not have to allow your child to take part in this study, and your refusal to allow your child to participate or your decision to withdraw him/her from the study will involve no penalty or loss of rights or benefits. The study personnel may choose to stop your child’s participation at any time.
  - You understand why the study is being conducted and how it will be performed.
  - You understand your rights as the parent/guardian of a research participant and you voluntarily consent to your child’s participation in this study.
  - You have been told you will receive a copy of this form.

______________________________  __________________________
Printed Name of Parent or Guardian                             Date

______________________________  __________________________
Signature of Parent or Guardian                             Date

For the Student Investigator or Designee: I certify that I have reviewed the contents of this form with the parent or guardian signing above. I have explained the possible benefits and the potential risks and/or discomforts of the study. It is my opinion that the parent or guardian understood the explanation.

______________________________  __________________________
Student Investigator                             Date

______________________________  __________________________
Signature of                      Date
Child Assent Form

You are being asked to be part of a research project being done by the University of North Texas Department of Learning Technologies.

This study involves a recording of your teacher in a classroom. You may appear in the video, but the main focus of the study is the teacher.

You will be asked to participate in class as you normally would.

If you decide to be part of this study, please remember that you can stop participating any time you want. Only the researchers will review the video tape.

If you would like to be part of this study, please sign your name below.

________________________________________
Printed Name of Child

________________________________________  ________________
Signature of Child      Date

________________________________________  ________________
Signature of Student Investigator                     Date
APPENDIX E

LESSON PLAN TEMPLATE
Detailed Lesson Plan
Please complete this lesson plan and choose a date for teaching the lesson.
First Name
Last Name
School
Subject
Lesson Title

Grade Level
Learning Goals/Objective

TEKS

Other goals

Materials needed for this lesson (tech and non-tech)

Lesson Overview - Share how the activities in the lesson will help to meet the learning goals. How will technology play a role in meeting the learning goals? *

Procedures - What is the minute-to-minute activity that will be happening in the lesson? Describe what the teacher is going to do and say, as well as what the students are going to do (First 10 min)

Procedures - What is the minute-to-minute activity that will be happening in the lesson? Describe what the teacher is going to do and say, as well as what the students are going to do (11-20 min)

Procedures - What is the minute-to-minute activity that will be happening in the lesson? Describe what the teacher is going to do and say, as well as what the students are going to do (21-30 min)

Procedures - What is the minute-to-minute activity that will be happening in the lesson? Describe what the teacher is going to do and say, as well as what the students are going to do (31-40 min)

Procedures - What is the minute-to-minute activity that will be happening in the lesson? Describe what the teacher is going to do and say, as well as what the students are going to do (41-50 min)

Procedures - What is the minute-to-minute activity that will be happening in the lesson? Describe what the teacher is going to do and say, as well as what the students are going to do (51-60 min)
enter NA if this does not apply to you
Procedures - What is the minute-to-minute activity that will be happening in the lesson? Describe what the teacher is going to do and say, as well as what the students are going to do (61-70 min) enter NA if this does not apply to you

Procedures - What is the minute-to-minute activity that will be happening in the lesson? Describe what the teacher is going to do and say, as well as what the students are going to do (71-80 min) enter NA if this does not apply to you

Procedures - What is the minute-to-minute activity that will be happening in the lesson? Describe what the teacher is going to do and say, as well as what the students are going to do (81-90 min) enter NA if this does not apply to you
REFERENCES


