The West Virginia Special Education Technology Integration Specialist Program:

Comparing Reported Expected and Actual Use by Teachers

West Virginia Department of EDUCATION
Office of Research
Division of Curriculum and Instruction

The West Virginia Special Education Technology Integration Specialist Program

Comparing Reported Expected and Actual Use by Teachers

Yetty Shobo

Nate Hixson

West Virginia Department of EDUCATION
Office of Research
Division of Curriculum and Instruction

West Virginia Department of Education
Division of Curriculum and Instructional Services
Office of Research
Building 6-Room 722 State Capitol Complex
1900 Kanawha Boulevard East
Charleston, WV 25305
http://wvde.state.wv.us/

February 2012

Jorea M. Marple
State Superintendent of Schools
West Virginia Department of Education

Robert Hull
Associate Superintendent
West Virginia Department of Education

Larry J. White
Executive Director
Office of Research

Suggested Citation

Shobo, Y.A, & Hixson, N. (2012). *The West Virginia Special Education Technology Integration Specialist program: Examining reported expected and actual use by teachers.* Charleston, WV: West Virginia Department of Education, Division of Curriculum and Instructional Services, Office of Research.

Content Contact
Yetty Shobo
Coordinator
Office of Research
yshobo@access.k12.wv.us

Contents

List of Figures

List of Tables

Introduction

The Technology Integration Specialist (TIS) program is intended to provide and coordinate professional development activities for all teachers and administrators on a school level basis so that they may become proficient in the use of 21st Century Technology Tools—a key component of Teach 21.[1] The TIS is an individual who assists schools by modeling, coaching, and mentoring teachers in using statewide technology resources to meet West Virginia's Content Standards and Objectives. The TIS also assists in the implementation of county and school technology plans and in the implementation of other county and school software applications.

The West Virginia Department of Education (WVDE) piloted the TIS program through Part D of Title II technology funds provided by the United States Department of Education (USDE). The program has now been expanded to include library media specialists (LMS), special educators, Title I teachers, career technical education (CTE) teachers, and county and school-based TISs who are supported through local county funds. Special educators were brought into the TIS program in April 2006. This study will evaluate how teachers who cotaught with, or with whom a special educator technology integration specialist (SE TIS) had some degree of influence, used technology before and after having a SE TIS in their school, their expectations of the SE TIS, and their overall expectations and perception of the SE TIS program.

The program is currently in its sixth round; each round of the program runs from early summer of one year to late spring of the next year although participants have until late summer of that next year to complete program requirements. At most, 25 participants are selected for each round. Some of the roles of a TIS, which also apply to SE TISs, are stated in the TIS Assurance Statement and Agreement (Office of Special Programs [OSP], 2011a), and include the following:

- Participate in and successfully complete 40 days (320 hours) of required professional development (including both online and face-to-face sessions).
- Use acquired technology integration skills to improve instruction for both students and educators.
- Use enhanced knowledge and skills to build effective consultative and coteaching relationships with all teachers.
- Utilize collaborative planning time to assist in integrating technology into the instructional units being planned by teachers.
- Serve as a resource to educators on technology integration, as appropriate, in the implementation of information literacy, independent learning, and social responsibility.
- Communicate the importance of developing 21st Century Skills for all students, including those with disabilities, to improve academic achievement and postsecondary outcomes.

[1] The other two components of Teach 21 are 21st Century Learning Skills and 21st Century Content Standards. For more details about Teach 21, visit http://wvde.state.wv.us/teach21/.

- Continue to teach students and educators in West Virginia public schools as a TIS in consultative and coteaching relationships for 2 years after completion of the 40 days of required professional development (explicitly stated for three of the TIS cases: Title I, CTE, LMS).

Participants in the TIS program receive a laptop and camera for their school from the WVDE and additional technology resources including white boards, LCD projectors, scanners, and color printers from their county office. In addition to these resources, participants receive the equivalent of 40 days (320 hours) of professional development and a $5,000 grant to help defray the costs of the required professional development. Grant funds can be used to pay the costs for stipends, substitute teachers, travel expenses, conference registration fees, and other costs associated with the teachers' participation in the required professional development. Upon completion of the program, participants may apply for a credential in instructional technology integration awarded by the WVDE Office of Professional Preparation.

Rationale for Study

The WVDE Office of Assessment, Accountability and Research (OAAR),[2] in collaboration with the Office of Instructional Technology; Office of Special Programs, Extended and Early Learning; and the Office of Career and Technical Instruction developed an evaluation plan to assist the WVDE in determining the impact of the TIS program on selected TIS applicants, participating schools, teachers, and students (OAAR, 2010). This study—which focuses on how other teachers with whom an SE TIS has cotaught or had some degree of influence perceive the program, and how having an SE TIS in their school has changed their technology use in their teaching—was conducted during the 2010-2011 school year as one component of that plan. It is the first examination of teacher perceptions about the program in its 6-year history.

Relevant Research

The evaluation model adopted for this and other components of the TIS evaluation plan was guided by the research of Thomas Guskey (2000), who proposed a five-level model for the evaluation of professional development programs that target student outcomes. Because the TIS program is a professional development initiative that aims to have an ultimate impact on student achievement, Guskey's five-level model is fitting.

Level 1 in Guskey's model, *Participant Reactions*, refers to the extent to which participants find the professional development to be of adequate quality, relevance, and usefulness. It is typically measured via event evaluation forms or interviews. Level 2, *Participant Learning*, acknowledges that participants must effectively learn the intended information for the program to create the intended change. Participant Learning is typically measured using surveys or knowledge tests. Level 3, *Organizational Support and Learning*, assesses the extent to which key stakeholders (e.g., school administrators and district staff) provided adequate support for the initiative. Level 4, *Participant Use of New Knowledge and Skills*, acknowledges that partici-

[2] The Office of Assessment, Accountability and Research was divided into two separate offices in 2008—the Office of Assessment and Accountability and the Office of Research. The Office of Research was charged with implementing the evaluation plan described in this report.

pants must actively use the information they have gained with fidelity in order to create the intended change. It is typically measured using observation checklists, rubrics, or a variety of other methods. Level 5, *Student Learning Outcomes*, deals with documenting the extent to which the program results in increased student achievement.

Evaluation Questions

The TIS evaluation plan included six overarching evaluation questions, aligned with Guskey's (2000) model, as a framework to guide the examination of the impact of the SE TIS program:

EQ1. To what extent is the training that is provided to participating TISs of adequate quality, relevance, and usefulness? (Guskey Level 1)

EQ2. To what extent does the TIS program build the capacity of participating TISs to plan and facilitate: (a) teaching and learning, (b) information access and delivery, and (c) program administration? (Guskey Level 2)

EQ3. To what extent do TISs encounter barriers to successful program implementation (e.g., financial, temporal, relational, etc.)? (Guskey Level 3)

EQ4. To what extent is the level of technology integration in TIS schools positively impacted through participation in the program? (Guskey Level 4)

EQ5. In what ways have school administrators and teachers leveraged the TIS and the resources provided by the TIS? (Intermediate)

EQ6. What impact has the TIS program had on students' technology literacy in participating schools? (Guskey Level 5)

This study, which uses school teachers' responses to two surveys administered at the beginning and end of the 2010-2011 school year, focuses on EQ5 but also touches on EQs 4 and 6. Other studies in this series will use data from administrators and SE TISs themselves to address other evaluation questions in the plan.

Methods

Pretest/posttest surveys of school teachers were used in this study, as described below.

Participant Characteristics

Colleagues of the SE TISs were the group studied in this survey investigation—that is, SE TIS coteachers and teachers with whom SE TISs believed they had the greatest influence (hereafter referred to as *teacher colleagues*).

Sampling Procedures

A nonprobability convenience sample was used in this study. SE TISs were asked to invite their coteacher or the teacher with whom they had the highest degree of influence (i.e., *teacher colleague)* to complete the Pre and Post Surveys. Some SE TISs had one, while others

had more than one coteacher. Consequently, at least 25 teachers were expected to complete the surveys; however, program staff are unsure about how many were invited by the SE TISs. Further, we do not have information about the number of times that SE TIS were reminded to invite their coteacher to complete the survey. Currently, there is no way to ascertain whether the same respondents completed the Pre and Post Surveys. However, the information available suggests that different respondents in the same school completed the Pre and Post Surveys in some cases. Further, some schools were represented in one survey but not the other.

Measures and Covariates

We used two online survey instruments in the study, the Special Education Technology Integration Specialist (SE TIS) Teacher Pre Survey (see Appendix A, page 23), and the Special Education Technology Integration Specialist (SE TIS) Teacher Post Survey (see Appendix B, page 27). The instruments were developed by the SE TIS program staff and staff at the Office of Research.

The questionnaires included demographic questions; multiple-choice response items that assessed teacher colleagues' technology use; and open-ended survey items that asked respondents to provide a descriptive account of the roles of the SE TIS, what the respondent hoped to accomplish (Pre Survey) or has accomplished (Post Survey) by working with an SE TIS during the year, and any additional comments they chose to provide. The survey was developed using Google Document Form.

The technology use items in the surveys used a 4-point scale to indicate how often respondents performed certain technological practices, such as "I use information from digital sources to promote learning and engage students in classroom activities," with *not usually* (1), *sometimes* (2), *often* (3), or *almost always* (4) as response options. The survey items were grouped into five sections based on the TIS Professional Development Model (OSEP, 2011b): (a) Designing and developing digital-age learning experiences and assessments, (b) Modeling digital-age work and learning, (c) Engaging in professional growth and leadership, (d) Promoting and modeling digital citizenship and responsibility, and (e) Facilitating and inspiring student learning and creativity. Items in these areas are labeled as *Design*, *Model, Engage*, *Promote*, and *Facilitate* in the present report. The five domains were obtained from the International Society for Technology in Education's (ISTE) national education technology standards for teachers (NETS-T). The items in each domain were constructed to reflect the objectives listed under each domain. The data from this survey were used as evidence to address EQ4 through EQ6.

Research Design

The school teacher's survey was administered twice to assess the extent to which the teachers expected and actually utilized the services of the TIS. The Pre Survey took place from August through October, 2010; the Post Survey occurred from May through September, 2011.

To analyze the data we used both quantitative and qualitative data analysis techniques to address EQs 4 to 5. For quantitative (multiple choice) items in the survey, we used SPSS 18 to produce descriptive statistics including frequencies (i.e., percentages), and to calculate and interpret measures of central tendency and dispersion (i.e., means and standard deviations). We also used independent samples *t* tests to examine whether differences in mean scores between

Pre and Post Surveys were statistically significant. Additionally, we calculated the effect sizes of the difference in scores between the Pre and Post Surveys using Cohen's *d*[3]; these effect sizes provide a measure of the strength of the difference in mean scores between the two surveys that is not affected by the sample size. Cohen (1988) interpreted effect sizes lower than 0.15 to be negligible, between 0.15 and 0.40 to be small, between 0.40 and 0.75 to be medium, between 0.75 and 1.10 to be large, and above 1.10 to be very large.

Qualitative responses (i.e., responses to open-ended questions) were read, organized, and coded according to broad themes, taking into consideration that respondents sometimes mentioned more than one theme when responding to a question. The identified themes were then described in a narrative form and compared with quantitative findings when appropriate. These themes are also presented in a tabular format to make it easy to compare themes that were salient in the Pre and Post Surveys.

Results

In all, there were 51 respondents in the Pre Survey and 31 in the Post Survey. The survey collected demographic data, responses to multiple choice items about technology use, and responses to open-ended questions.

Respondent Demographics

Respondents were asked how long they had been teaching. More than half had been teaching for more than 15 years and less than 20% had been teaching for less than 5 years in the Pre Survey (Table 1), indicating that the sample included quite experienced teachers. Respondents in the Post Survey also had been teaching for quite a while; however the Post Survey included a higher percentage of teachers with less than 5 years of experience.

Although most of the respondents had been teaching for a

Table 1. Respondents' Demographics

Characteristic	Pre (n = 51)	Post (n = 31)
Years of teaching experience		
0 to 1 year	3.9	6.5
1 to 5 years	13.7	19.4
11 to 15 years	11.8	19.4
6 to 10 years	11.8	16.1
More than 15 years	58.8	38.7
Length of time coteaching with SE TIS		
Less than 1 year	5.9	19.4
1 to 2 years	33.3	19.4
2 to 4 years	15.7	35.5
More than 4 years	5.9	9.7
We've never cotaught together before	27.5	12.9
Not Applicable	11.8	3.2
Majority taught		
General education	86.3	80.6
Teach an equal proportion of both	5.9	9.7
Special education	7.8	9.7
Role in School		
Speech Language Pathologist	2	0
Special Education	2	0
Teacher	96.1	93.5
Support staff	0	3.2
Missing data	0	3.2

[3] Cohen's *d* is defined as the difference between two means divided by a standard deviation for the data.

while, most had not been coteaching with the SE TIS for very long. In the Pre Survey, about 6% had been coteaching with their SE TIS for less than a year and approximately 33% and 16% had been coteaching for between 1 to 2 years and 2 to 4 years, respectively. In the Post Survey, about 19% had been coteaching for less than a year and approximately 19% and 35% have been teaching for between 1 to 2 years and 2 to 4 years, respectively. About a quarter reported that they have never cotaught with the SE TIS in the Pre Survey compared to 13% in the Post Survey.

Table 2. County Location of Respondents' School

Provider	Pre (n = 51)	Post (n = 31)
Barbour	3	2
Berkeley	2	3
Cabell	12	1
Fayette	0	2
Greenbrier	2	2
Harrison	4	3
Jackson	0	1
Logan	4	3
Mercer	5	3
Mineral	8	1
Mingo	2	3
Ohio	2	1
Putnam	2	1
Raleigh	1	1
Randolph	1	2
Tucker	1	1
Wood	1	0
Wyoming	1	1
Total	51	31

Respondents in the surveys were also asked, "Are the majority of your students taught in the special education or regular environment?" A majority of the respondents in both surveys mentioned that they teach most of their students in the general education environment; less than 10% in both surveys reported that they teach their students solely in the special education environment.

The survey asked respondents about their role within their school. In the Pre Survey, about 96% reported that they are teachers whereas one respondent each indicated roles as a special education teacher and a speech language pathologist. In the Post Survey, 93.5% of respondents identified as teachers, 3.2% as support staff, and the roles of 3.2% were missing.

In addition, respondents were asked about the county in which their schools were located. A total of 16 counties were mentioned by the 51 respondents in the Pre Survey. The 31 respondents in the Post Survey mentioned 17 counties (Table 2). It is important to note that respondents from some counties were present in the Pre Survey but missing from the Post Survey and vice versa.

Technology Use Assessment Items

As described earlier, respondents were asked to indicate how often they perform certain technological practices, on a 4-point Likert-type scale with the response options, *not usually* (1), *sometimes* (2), *often* (3), and *almost always* (4) in five types of activity. Table C- 1 (page 31) displays a list of the items and their Pre and Post Survey mean scores, categorized by the five types of activity. Summary data for these items are presented in Table 3, below.

Table 3. Differences in Mean Scores of Pre and Post Survey Technology Activity Scales

Activity Type	Pre (2010)			Post (2011)			Significance of difference		Cohen's *d* effect size	Interpretation
	Mean	SD	α	Mean	SD	α	*t*	*P*		
Design	2.32	0.62	0.83	2.67	0.71	0.86	-2.25	0.03 *	0.54	Medium effect
Model	2.51	0.72	0.79	2.74	0.61	0.72	-1.5	0.14	0.33	Small effect
Engage	2.21	0.75	0.84	2.53	0.69	0.82	-1.91	0.06	0.44	Medium effect
Promote	2.69	0.76	0.76	2.92	0.70	0.70	-1.42	0.16	0.33	Small effect
Facilitate	2.45	0.70	0.86	2.79	0.70	0.89	-2.11	0.04 *	0.49	Medium effect

*Statistically significant at the .05 level

The following sections focus on each of the five activity types and present information on reported mean score changes between the Pre and Post Surveys.

Designing and developing digital-age learning experiences and assessments

Based on the survey responses from respondents in the Pre and Post Surveys, it appears that the SE TIS program is associated with a higher practice of designing and developing digital-age learning experiences and assessments. Survey items for this scale included the following:

Design1 I use a blend of both face-to-face and online environments to deliver instruction to my students.

Design2 I design and/or implement projects that emphasize creative thinking and require students to engage in problem-solving, decision-making and experimental inquiry, using digital resources/tools when appropriate.

Design3 I often design and/or utilize student-centered formative and performance-based assessments using available digital resources and tools.

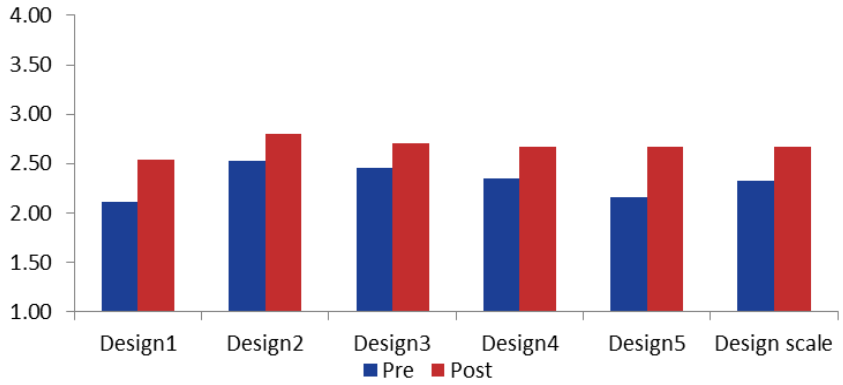
Design4 I use digital resources and tools to make assignments for students that are based upon their individual interests, abilities and learning needs.

Design5 I require my students to set personal learning goals and to self-assess their progress toward meeting those goals, using digital resources and tools when available and appropriate.

The mean scores for the five items at Post Survey were higher than those at Pre Survey (Figure 1 and Table C- 1, page 31). However, independent samples *t* tests revealed that only one mean score change was significant at 0.05 level: Coteachers, other teachers, and support staff with whom the SE TIS had significant influence (hereafter, *teacher colleagues*) were significantly more likely in the Post Survey to require their "students to set personal learning goals and to self-assess their progress toward meeting those goals, using digital resources and tools when available and appropriate." Three of the mean score changes can be categorized as having a medium effect—that is, showing a standardized mean score (*d)* change of .40 to .75—whereas two of the mean score changes can be categorized as having small effects—that is, having a standardized mean score change of .15 to .40 (Cohen, 1988).

We constructed a *Design* scale score using the mean scores of the five Design items at Pre and Post Surveys. The reliability (α)—a measure of internal consistency of the five items—was high[4] at both Pre and Post Surveys (Table 3, page 7). Comparing the score of the Design scale at Pre and Post Surveys, a higher practice of designing and developing digital-age learning experiences and assessments was reported at Post Survey compared to Pre Survey (Figure 1). Table 3 shows that the recorded change is significant at the 0.05 level and it accrued a medium effect.

Figure 1. Pre and Post Mean Scores of Items in the Design Scale



Modeling digital-age work and learning

Independent samples *t* tests of Pre and Post Survey data revealed that SE TIS coteachers and teacher colleagues are not statistically significantly more likely to model digital-age work and learning since having an SE TIS in their school. Survey items for this scale included the following:

Model1 I use digital resources and tools to communicate with students.

Model2 I use digital resources and tools to communicate with my peers.

Model3 I use digital resources and tools to communicate with parents and the community outside of my school.

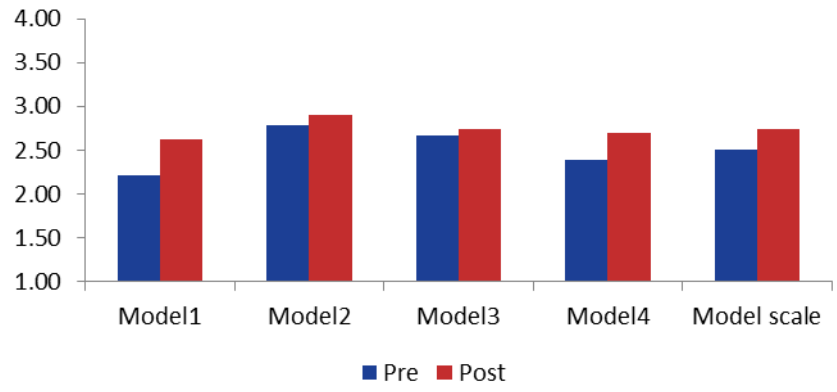
Model4 I customize the available digital resources and tools such as WV Writes (formerly Writing Roadmap), Acuity, techSteps, etc. to personalize learning for my students.

Model1, m,"I use digital resources and tools to communicate with students," only approached significance. This item was also the only one that showed a medium effect on the mean score. Two of the changes in mean scores indicated a negligible effect and one a small effect in the change in score on the relevant items (Table C- 1, page 31).

[4] A value of .70 for Cronbach's alpha (a measure of internal consistency) is typically considered sufficient reliability in the social sciences (Nunnally, 1978).

We constructed a *Model* scale score using the mean scores of the four Model items at Pre and Post Surveys. The reliability (α) of this score was high at both Pre and Post Surveys (Table 3, page 7). Comparing the mean score of the Model scale at Pre and Post Surveys shows a higher reported practice of modeling digital-age work and learning at Post Survey compared to Pre Survey (Figure 2). The change, however, had only a small effect, which was not statistically significant (Table 3).

Figure 2. Pre and Post Mean Scores of Items in the Model Scale



Engaging in professional growth and leadership

Four items were used to assess the extent to which SE TIS coteachers and teacher colleagues have used technology to engage in professional growth and leadership. Survey items for this scale included the following:

Engage1 I participate actively in local communities of practice with my fellow teachers, either online or face-to-face.

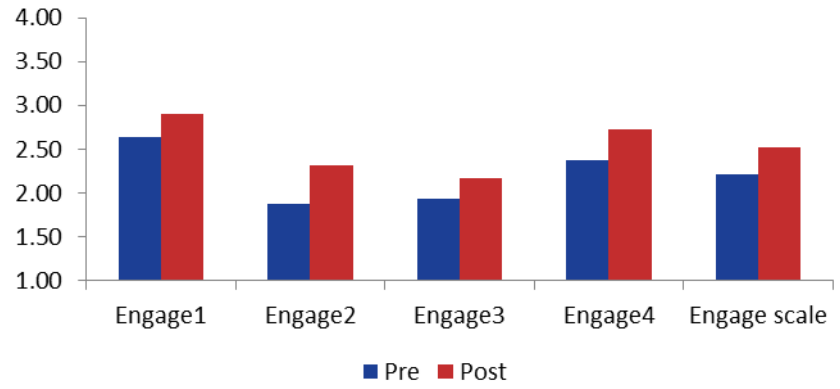
Engage2 I participate actively in online/global communities with other educators outside of my local community to gather and discuss resources and ideas related to student achievement and learning.

Engage3 I model and teach other educators to use digital tools and resources to promote student achievement and learning.

Engage4 I regularly seek out digital resources, tools and research and evaluate its quality and relevance prior to using it in the classroom.

Although the mean scores of the four items at Post Survey were higher than the mean scores at Pre Survey (Figure 3), only one of the changes was significant at the 0.05 level (Table C- 1, page 31). Teachers at Post Survey were significantly more likely to "participate actively in online/global communities with other educators outside of [their] local community to gather and discuss resources and ideas related to student achievement and learning" (Engage2). This was the only change that resulted in a medium effect; the other three changes in mean scores accrued only small effects.

Figure 3. Pre and Post Mean Scores of Items in the Engage Scale



We constructed an *Engage* scale score using the mean scores of the four Engage items at Pre and Post Surveys. The reliability (α) was high at both Pre and Post Surveys (Table 3, page 7). Comparing the score of the Engage scale at Pre and Post Surveys, shows that respondents reported higher practice of using technology to engage in professional growth and leadership at Post Survey compared to Pre Survey (Figure 3). Although the change only approached statistical significance at the 0.06 level, it had a medium effect (Table 3).

Promoting and modeling digital citizenship and responsibility

Three items were used to assess the extent to which SE TIS coteachers and teacher colleagues have used technology to promote and model digital citizenship and responsibility. Survey items for this scale included the following:

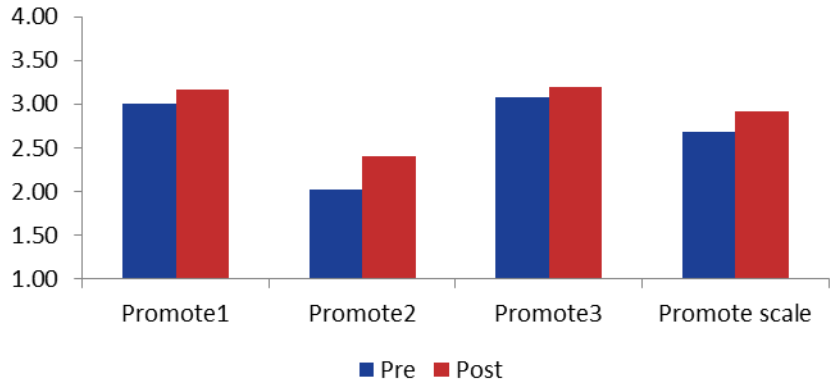
Promote1 I advocate, model and teach my students about safe, legal and ethical use of digital information and technology, including respect for copyright, intellectual property, and the appropriate documentation of sources.

Promote2 I offer students opportunities to use digital resources and tools to participate in collaborative projects with students of other cultures that address current problems, issues or themes.

Promote3 Students in my class model appropriate online behavior and social interaction through digital activities in my classroom.

Although the mean scores of the three items at Post Survey were higher than the mean scores at Pre Survey (Figure 4), none of the changes was statistically significant at 0.05 level (Table C- 1, page 31). One of the changes in mean scores indicated a medium effect (Promote2) whereas the other two changes in mean scores accrued only negligible (Promote3) and small effects (Promote1).

Figure 4. Pre and Post Mean Score of Items in the Promote Scale



We constructed a *Promote* scale using the mean scores for the three items at Pre and Post Surveys. The reliability (α) was moderately high at both Pre and Post Surveys (Table 3, page 7). A comparison of the score of the Promote scale at Pre and Post Surveys shows that a higher practice of promoting and modeling digital citizenship and responsibility was reported at Post Survey compared to Pre Survey (Figure 4). The change, however, had only a small effect (Table 3) and was not significant.

Facilitating and inspiring student learning and creativity

Five items were used to assess the extent to which SE TIS coteachers and teacher colleagues used technology to facilitate and inspire student learning and creativity. Survey items for this scale included the following:

Facilitate1 I use information from digital sources to promote learning and engage students in classroom activities.

Facilitate2 I require my students to use digital resources and tools for writing, collaboration, reflection, research, and other assignments.

Facilitate3 I engage my students in real-world issues and authentic problem-solving.

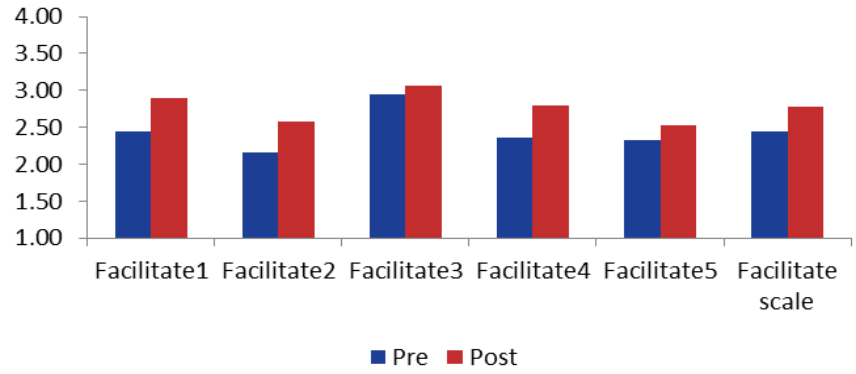
Facilitate4 I require my students to gather information from sources other than their textbooks in order to complete their daily assignments.

Facilitate5 I require my students to present information and actively teach content to their fellow students and/or community members.

Although the mean scores of the five items at Post Survey were higher than the mean scores at Pre Survey (Figure 5), only two (Facilitate1 and Facilitate4) showed changes were sig-

nificant at 0.05 level (Table C- 1, page 31). The change in mean scores in one other item (Facilitate2) also approached significance. The change in these three listed items accrued medium effects and the change in the mean score of the remaining two items only accrued small effects.

Figure 5. Pre and Post Mean Scores of Items in the Facilitate Scale

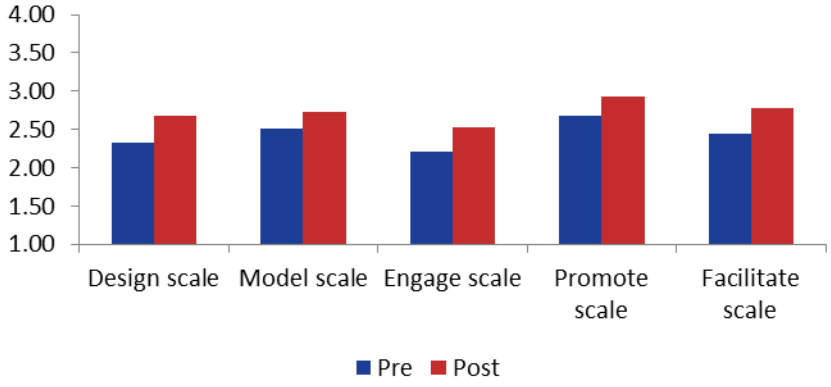


We constructed a *Facilitate* scale using the mean of the scores for the five Facilitate items at Pre and Post Surveys. The reliability (α) was high at both Pre and Post Surveys (Table 3, page 7). Comparing the score of the Facilitate scale at Pre and Post Surveys, shows a higher practice of using technology to facilitate and inspire student learning and creativity at Post Survey compared to Pre Survey (Figure 5). The change indicated a medium effect (Table 3) and was also significant.

Comparison of the scales

Table 3 (page 7) and Figure 6 present a comparison of the five scales developed from items that were included in the Pre and Post Surveys of SE TIS coteachers and teacher colleagues. The rank order of the scales was about the same at Pre and Post Surveys, meaning respondents' report of the order of the five main ways they use technology remained nearly the same. The only change was that the mean score of the Model scale ranked second and the mean score of the Facilitate scale ranked third in the Pre Survey but at Post Survey their ranks reversed. Respondents were

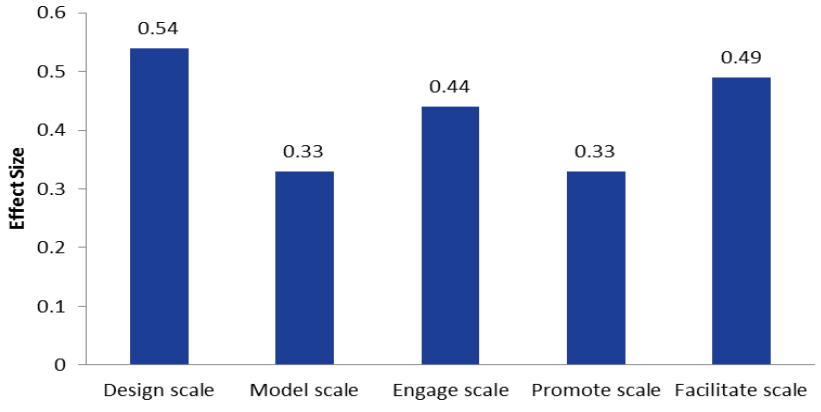
Figure 6. Comparisons of Pre and Post Mean Scores for the Technology Use Scales



most likely to report that they used technology to promote and model digital citizenship and responsibility and were least likely to report that they use technology to engage in professional growth and leadership, in both the Pre and Post Surveys.

Additionally, they were more likely to use technology in all five main ways at Post Survey compared to Pre Survey. The highest increase in mean score was recorded for the Design scale and the least increase in mean score was recorded for the Model scale. The change in mean score was second, third, and fourth highest for the Facilitate, Engage, and Promote scales, respectively. There was medium effect for the change in the mean scores for the Design, Engage, and Facilitate scales; the effect was small for the Model and Promote scales (Figure 7). Further, based on the mean scores, it can be concluded that at both Pre and Post Surveys, respondents were likely to use technology in the five listed ways "sometimes," because the mean scores for all the scales were above 2, with higher use consistently reported at Post Survey.

Figure 7. Effect Size by Technology Use Scales



Responses to Open-Ended Questions

Respondents were asked three open-ended questions on the surveys. We identified themes in the responses to these questions, as described below.

Expected role of SE TIS

The first open-ended question in both surveys asked respondents what they believed the role of the SE TIS should be in their school. Table 4 presents the themes identified and the number of respondents mentioning the identified themes; a total of 36 individuals responded to the question in the Pre Survey and 25 responded in the Post Survey.

Table 4. Expected Roles of the SE TIS

Theme	Frequency of Comments* Pre (n = 36)	Post (n = 25)
Technology use resource person for teachers	15	8
Technology use resource person for students	0	3
Technology use resource person for teachers and students	10	5
Technology use resource person for teachers, students, and administrators	1	0
Technology or general resource person	1	4
Facilitator of students' learning experience	5	4
Good learning opportunity	1	0
Helper	1	0
Not sure	2	1

*Frequency of comments may exceed the number of respondents (n), because some respondents provided more than one comment.

Pre Survey

Most comments described the SE TIS as a technology-use resource person for other teachers in the general and/or special education classrooms, keeping school staff up to date on the latest relevant technology and helping in day-to-day integration of technology in the curriculum. Fifteen comments mentioned this theme, for example,

> Providing additional digital learning opportunities for the classroom and supporting teachers in learning and incorporating technology.

On a similar note, ten comments indicated respondents expected the SE TIS to be a technology-use resource person for both teachers and students, for example,

> Help out teachers to use more technology in classroom to help special and regular education students.

One person reported that an SE TIS is a technology use resource person not only for teachers and students but also for administrators:

> To help assist teachers, students, and administrators with technology in the classroom and help special education students become better associated with technology and the curriculum.

Along the same theme, one respondent reported that the SE TIS should be a technology or general resource person, that is, "Technology use-teachers."

Another four comments described the SE TIS as a person that facilitates general and/or special education students' learning, for example,

> I think the role of the SE TIS is to help the GE teacher enhance student learning and engagement through the use of technology. The SE TIS not only enhances the learning of those students with special needs, but all learners [in] the classroom.

Two comments mentioned that the role of the SE TIS is to help other teachers, for example, "Help-mate."

One respondent saw having an SE TIS as a generally good learning opportunity:

> I am very excited about learning how to use these tools in my classroom. Writing Roadmap, Edline communication with parents, and techSteps are the only real experiences I've had in the class. I would really like to learn more.

Two comments expressed a lack of clarity about the role of an SE TIS.

Post Survey

In the Post Survey when teachers were asked about what they expect the role of the SE TIS to be, a majority reported that they view them as a technology-use resource person for general and/or special education teachers. Eight of the total 23 comments in response to the question mentioned roles similar to those in this quote:

> To train teachers to incorporate more technology in the classroom. Also trouble [shoot] problems when things are not working correctly.

Another five comments expressed the expectation that the SE TIS will be a technology use resource person to both teachers and students, for example,

> Educate students and staff on the use of technology and its many benefits to teaching and learning.

Three comments mentioned that respondents expect the SE TIS person to be a resource person primarily to students, for example,

> I think the role of the SE TIS is to use technology tools to enhance the lesson. The SE TIS can provide technological tools to better engage students in the content.

Similarly, four comments expressed the view that an SE TIS is a general resource person, for example,

> Helping the classroom teacher find appropriate materials to use in the classroom.

Four comments noted that the SE TIS should facilitate students' learning experience, for example,

> I think that the program helps to engage the students in the learning process.

Finally one respondent in the Post Survey was not sure of the role of an SE TIS.

Expected and observed outcomes of having an SE TIS

The second open-ended question in the Pre Survey asked respondents about what they hope to accomplish as a result of having an SE TIS in their school. A similar question in the Post Survey asked respondents what they have accomplished as a result of having an SE TIS in their school. Table 5 shows the distribution of the themes in both the Pre and Post Surveys, with 20 and 14 respondents, respectively.

Table 5. Expected and Reported Outcomes of Having an SE TIS

Theme	Frequency of comments* Pre (n = 20)	Post (n = 14)
Increased technology knowledge	21	18
Support for teaching	7	7
Support other teachers through acquired knowledge	0	1
Support for students	11	6

*Frequency of comments may exceed the number of respondents (n), because some respondents provided more than one comment.

Pre Survey

Increase in the use of technology by teachers was the most expected outcome of the SE TIS program; 21 comments mentioned this theme. Specifically, respondents expect that an SE TIS would help teachers to learn what technological equipment and practices were available to help them in their teaching, for example,

> I hope to gather a better understanding of technology and hope to learn effective teaching strategies using various technology.

Apart from wanting to increase their knowledge and use of technology, seven respondents wanted general support, such as help with lesson planning, from the SE TIS, for example,

> Create and use more activities and programs [that] I can use with my students.

Another 11 respondents expected having an SE TIS to be supportive of students and their learning, for example,

> To be able to improve student's academic success while integrating technology.

Post Survey

The most commonly expected accomplishment of the SE TIS program by respondents in the Pre Survey—increased technology knowledge—was the most realized outcome of the program. Eighteen comments mentioned this theme in the Post Survey, for example,

> By working with the SE TIS this year, I was able to incorporate various technology tools that worked to enhance the content material…

Another seven comments indicated respondents felt the SE TIS supported their overall teaching and not just in regards to technology use, for example,

> We collaborated in our ideas and I received technology suggestions and advice from the TIS to explore and use more areas of technology in our classroom.

Another six comments observed that the SE TIS program has provided support specifically to students and engendered higher student engagement, for example,

> …I believe students were more engaged in the content because of the technology that was used. In addition, I feel as though those students with disabilities greatly benefited from the work of the SE TIS.

Finally, one respondent reported that, not only did he or she gain more knowledge regarding technology, he or she was able to help other teachers explore using technology in teaching:

> I was able to use many digital resources in my classroom and to teach many other teachers how to use digital resources in their classrooms.

Additional comments

Fourteen respondents provided additional comments in both the Pre Survey, while 11 respondents provided comments in the Post Survey (see Table 6).

Table 6. Additional Comments About the SE TIS Program

	Frequency of comments	
Theme	Pre (n = 14)	Post (n = 11)
Complimentary of SE TIS	5	3
Complimentary of program	2	4
Teachers benefit	1	3
Students benefit	1	3
Teachers and students benefit	2	0
Cutting edge learning	1	0
Critical of SE TIS	1	0
Critical of available technology in class	1	1

*Frequency of comments may exceed the number of respondents (n), because some respondents provided more than one comment.

Pre Survey

Twelve of the 14 comments in the Pre Survey were positive and were categorized into six main themes in Table 6. The most commonly mentioned theme, identified in five comments, was a compliment about the SE TIS program, for example,

> My SE Tech made a huge difference in my classroom last year. When she could she would tell me about a site to visit or tell me how I might better use some technology in my room, she would do so. She was invaluable to me.

Two comments also complemented respondents' SE TISs and noted on the benefits of the program to teachers and students:

> I think it is a wonderful program!

> I think it is a beneficial program to help teachers and students. I look forward to learning more technology to help my students.

One respondent commented on the benefits of the program to teachers and another on its benefit to students:

> I think this is very beneficial to teachers, since their time and resources are limited.
>
> I feel the students benefit from the expertise of both teachers which provides a greater learning experience for all learners.

The last positive comment mentioned that the program provided cutting edge learning.

Two negative comments were also made. One comment each was critical of the SE TIS and of the technology in the classrooms:

> Know it all attitude gives bad impressions.
>
> I wish all of my technology in my classroom actually worked!!!

Post Survey

Eleven respondents provided 14 additional comments in the Post Survey, resulting in five themes (Table 6). Four of the themes were positive and one theme was negative. The most commonly mentioned theme, expressed in four comments, was the great benefit that the SE TIS program is to schools, for example,

> It's a great program, especially since we have not Title 1 funding at my school.

Three comments each were complimentary of the SE TIS, noting the beneficial impact of the program on teachers and students as illustrated in the next three quotes:

> I am pleased to have a teacher from the SE TIS program to assist with technological ideas in my classroom. I feel that we were able to incorporate a variety of digital projects with her assistance.
>
> I think it is very valuable to the assistance of the classroom teacher.
>
> …All students, those with or without a disability, benefit from the incorporation of technology. This program is essential for teachers to provide 21st century learning opportunities to students…

Finally, one respondent was critical of the state of the technologies available in the classrooms:

> I feel that the SE TIS program should strive to provide more updated technology to special education students, and general education students in order to help them compete on a global level, both academically and professionally.

Discussion

This study used quantitative and qualitative survey data collected using two surveys—a Pre Survey administered early in the 2010–2011 school year and a Post Survey administered after the school year ended—from respondents with whom the SE TISs cotaught or had some degree of influence. The study was intended to evaluate the impact and the expected and reported use of the SE TIS program during that school year.

As indicated previously, this study focuses on EQ5 but also touches on EQ4 and EQ6. To address EQ5—which asks about ways school teachers leveraged the SE TIS and the resources provided by the SE TIS—analysis suggests that the program has had a positive impact in several key areas. Specifically, the SE TIS program is associated with higher incidence of teachers (a)

designing and developing digital-age learning experiences and assessments; (b) modeling digital-age work and learning; (c) engaging in professional growth and leadership; (d) promoting and modeling digital citizenship and responsibility; and (e) facilitating and inspiring student learning and creativity. The associated effects of the SE TIS program in these five areas vary from small to medium. This result was further illustrated with the qualitative data where we found the expected and reported outcomes of the SE TIS program to be very similar. Overall, respondents were complimentary of the program in general and of their SE TISs specifically; negative comments were mentioned by very few teachers. Respondents also identified that the benefits of the program are not just limited to teachers but are experienced by students and other school personnel, as well.

These same technology use data also provided some evidence to address EQ4—To what extent is the level of technology integration in TIS schools positively impacted through participation in the program? The data suggest that the level of technology integration in TIS schools has been moderately impacted positively through participation in the program, as the mean scale score changes ranged from small to medium effects. Further, the results indirectly address EQ6—What impact has the TIS program had on student's technology literacy in participating schools? By experiencing these five domains, the respondents would likely have a positive impact on their student's technology literacy.

These results should, however, be used with some caution because of the following limitations. It is important to note that the "separate pre post sample design" (Trochim, 2006) employed here is not strong because one cannot match individual participant responses from pre to post. Consequently, the study could only examine changes in the average respondent technology use in the five main domains. The study, thus, runs the risk that the pre and post groups are nonequivalent, which may have biased any of the discussed findings. Additionally, bias could arise from the lack of uniformity arising from having the same person respond to both the Pre and Post Surveys in some schools and different respondents respond to the two surveys in other schools. No information is currently available to identify what percentage of respondents was the same across waves and what percentage was different. In the future, it would be helpful if respondents could be matched between the two waves of data collection without compromising their anonymity so that individual-level analysis could be conducted, limiting bias. Such analyses may have to occur for respondents in several survey rounds to ensure that the analysis has sufficient power. It is also critical to acknowledge that identifying information such as the name of the school or county (which were requested in the survey), while important for accounting for which participating schools had not completed the survey, may have led respondents to provide desirable responses.

Another limitation is that the study could not ascertain the degree of self-selection in who responded to the open-ended questions. As few as 35% and 27% of respondents provided responses to one of the open-ended questions in the Pre and Post Surveys, respectively. Consequently, it is difficult to ascertain whether all respondents generally felt positive toward the program as indicated in the responses or whether nonresponse to these questions was more likely to occur with those who felt negative about the program. Additionally, there is some diversity in the roles reported by the respondents. Although a majority of respondents identified as teachers, one or two respondents in the Pre and Post Surveys identified themselves as a support and/or

intervention staff. Some differences in the roles of these staff compared to teachers in ways that affect their expected and actual use of the SE TIS could be of significant importance to the findings of this survey.

Despite these limitations, the results from this study suggest that the SE TIS program has been very successful in West Virginia, particularly in the areas of providing a technology use resource for teachers and students. It is likely that the SE TIS program will continue to meet its goals of providing individuals who assist schools by modeling, coaching and mentoring teachers in using statewide technology resources to meet West Virginia's Content Standards and Objectives and in the implementation of county and school technology plans and in the implementation of other county and school software applications.

Recommendations

Based on the results of this study, the following recommendations are provided to improve the implementation, results, and evaluation of the SE TIS program.

- Explore innovative ways in which the SE TIS program could respond to the two criticisms of the program—the dilapidated technology equipment in some classroom and the negative attitude that at least one SE TIS exuded.
- Make SE TISs aware of the expectations of teachers as revealed in surveys. This could help them better realize what their fellow teachers may be expecting.
- Train SE TISs to focus on technology use items with low scores and low change scores. For example, respondents' Post Survey mean score on one Engage item, which focused on whether they "model and teach other educators to use digital tools and resources to promote student achievement and learning" was only slightly higher than 'sometimes,' indicating such practices could be strengthened further.
- Explore ways of designing the surveys such that the same respondent completes both Pre and Post Surveys so that the data can be matched.
- Remove questions requesting identifying labels that would serve to suggest that obtained data are not anonymous from the survey, if such removal will not jeopardize accountability.

References

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences (second ed.)*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Guskey, T. R. (2000). *Evaluating professional development*. Thousand Oaks, CA: Corwin Press, Inc.

Nunnally, J. C. (1978). *Psychometric theory (2nd ed.)*. New York: McGraw-Hill.

Office of Assessment, Accountability and Research (2010). *A mixed method case study evaluation model for the WV Technology Integration Specialist (TIS) Program*. Charleston, WV: West Virginia Department of Education, Division of Curriculum and Instructional Services. Retrieved from http://wvde.state.wv.us/osp/TISEvaluationProposal.pdf.

Office of Special Programs (2011a). Memorandum. March 2011. Charleston, WV: West Virginia Department of Education, Division of Curriculum and Instructional Services. Retrieved from http://wvde.state.wv.us/osp/SETISinitiative3-2011.pdf.

Office of Special Programs (2011b). *2011 - 2012 TIS Professional Development Model*. Charleston, WV: West Virginia Department of Education, Division of Curriculum and Instructional Services. Retrieved from http://wvde.state.wv.us/osp/2011-12TISpdmodel%20(2).pdf.

Trochim, W. M. K. (2006). *Other quasi-experimental designs*. In Research methods knowledge base. Retrieved from http://www.socialresearchmethods.net/kb/quasioth.php.

Appendix A. SE TIS Teacher Pre Survey (2011)

Special Education Technology Integration Specialist (SE TIS) Program Teacher Survey (2011)

This survey is intended to serve as an assessment of your prior integration of technology into your instruction and the ways in which you intend to utilize the Special Education Technology Integration Specialist (SE TIS) at your school. It is important that you spend time to reflect on each question and honestly consider the extent to which each statement is true of your past practice. Please note that you will receive a second survey near the end of the school year to help WVDE better understand how you have leveraged the services of the SE TIS in your school and what impact the SE TIS has had on your instructional practices. This information will only be used to evaluate the SE TIS program. All information is anonymous and will only be reported at the aggregate level.

In which county do you currently work?

Please indicate the name of your school.

What is your role in your school?

- Teacher
- Administrator
- Aide
- Support Staff
- Other:

Are the majority of your students taught in the special education or regular education environment?

- Special education
- General education
- I teach an equal proportion of both

How many years of experience do you have as a teacher?

- 0 to 1 year
- 1 to 5 years
- 6 to 10 years
- 11 to 15 years
- More than 15 years

How long have you been co-teaching with your SE TIS?

- We've never co-taught together before.
- Less than 1 year
- 1 to 2 years
- 2 to 4 years
- More than 4 years
- Not applicable

Section I: Facilitating and Inspiring Student learning and Creativity

Please indicate the extent to which the following statements are true of yourself. Please think about the most recently completed school year as you respond to each item.

I use information from digital sources to promote learning and engage students in classroom activities.

Not Usually Sometimes Often Almost always

I require my students to use digital resources and tools for writing, collaboration, reflection, research, and other assignments.

Not Usually Sometimes Often Almost always

I engage my students in real-world issues and authentic problem-solving.

Not Usually Sometimes Often Almost always

I require my students to gather information from sources other than their text books in order to complete their daily assignments. (e.g., podcasts, videos, etc.)

Not Usually Sometimes Often Almost always

I require my students to present information and actively teach content to their fellow students and/or community members.

Not Usually Sometimes Often Almost always

Section II: Designing and Developing Digital-Age Learning Experiences and Assessments

Please indicate the extent to which the following statements are true of yourself. Please think about the most recently completed school year as your respond to each item.

I use blend of both face-to-face and online environments to deliver instruction to my students.

Not Usually Sometimes Often Almost always

I design and/or implement projects that emphasize creative thinking and require students to engage in problem-solving decision-making and experimental inquiry, using digital resources/tools when appropriate.

Not Usually Sometimes Often Almost always

I often design and/or utilize student-centered formative and performance-based assessments using available digital resources and tools (e.g., WV Writes, Acuity, TechSteps, etc.)

Not Usually Sometimes Often Almost always

I use digital resources and tools to make assignments for students that are based upon their individual interests, abilities, and learning needs.

Not Usually Sometimes Often Almost always

I require my students to set personal learning goals and to self-assess their progress toward meeting those goals, using digital resources and tools when available and appropriate.

Not Usually Sometimes Often Almost always

Section III: Modeling Digital-Age Work and Learning

Please indicate the extent to which the following statements are true of yourself. Please think about the most recently completed school year as your respond to each item.

I use digital resources and tools to communicate with students.

Not Usually Sometimes Often Almost always

I use digital resources and tools to communicate with my peers.

Not Usually Sometimes Often Almost always

I customize the available digital resources and tools such as WV Writes (formerly Writing Roadmap), Acuity, TechSteps, etc. to personalize learning for my students.

Not Usually Sometimes Often Almost always

Section IV: Promoting and Modeling Digital Citizenship and Responsibility

Please indicate the extent to which the following statements are true of yourself.

Please think about the most recently completed school year as you respond to each item.

I advocate, model and teach my students about safe, legal and ethical use of digital information and technology, including respect for copyright, intellectual property, and the appropriate documentation of sources.

Not Usually Sometimes Often Almost always

I offer students opportunities to use digital resources and tools to participate in collaborative projects with students of other cultures that address currently problems, issues or themes.

Not Usually Sometimes Often Almost always

Students in my class model appropriate online behavior and social interaction through digital activities in my classroom.

Not Usually Sometimes Often Almost always

Section V: Engaging in Professional Growth and Leadership

Please indicate the extent to which the following statements are true of yourself.

Please think about the most recently completed school year as your respond to each item.

I participate actively in local communities of practice with my fellow teachers, either online or face-to-face.

Not Usually Sometimes Often Almost always

I participate actively in on-line/global communities and other educators outside of my local community to gather and discuss resources and ideas related to student achievement and learning.

Not Usually Sometimes Often Almost always

I model and teach other educators to use digital tools and resources to promote student achievement and learning.

Not Usually Sometimes Often Almost always

I regularly seek out digital resources, tools and research and evaluate its quality and relevance prior to using it in the classroom.

Not Usually Sometimes Often Almost always

Section VI: Open-Ended Items

What do you think is the role of the SE TIS?

What do you hope to accomplish to working with an SE TIS this year?

Please provide any additional comments you may have about the SE TIS program.

Appendix B. SE TIS Teacher Post Survey (2011)

Special Education Technology Integration Specialist (SE TIS) Program Teacher Survey (2011)

This survey is intended to serve as an assessment of your prior integration of technology into your instruction and the ways in which you intend to utilize the Special Education Technology Integration Specialist (SE TIS) at your school. It is important that you spend time to reflect on each question and honestly consider the extent to which each statement is true of your past practice. Please note that you will receive a second survey near the end of the school year to help WVDE better understand how you have leveraged the services of the SE TIS in your school and what impact the SE TIS has had on your instructional practices. This information will only be used to evaluate the SE TIS program. All information is anonymous and will only be reported at the aggregate level.

In which County do you currently work?

Please indicate the name of your schools

What is your role in your school?
- Teacher
- Administrator
- Aide
- Support Staff
- Other:

Are the majority of your students taught in the special education or regular education environment?
- Special education
- General education
- I teach an equal proportion of both

How many years of experience do you have as a teacher?
- 0 to 1 year
- 1 to 5 years
- 6 to 10 years
- 11 to 15 years
- More than 15 years

How long have you been co-teaching with your SE TIS?
- We've never co-taught together before.
- Less than 1 year
- 1 to 2 years
- 2 to 4 years
- More than 4 years
- Not applicable

Section I: Facilitating and Inspiring Student Learning and Creativity

Please indicate the extent to which the following statements are true of yourself. Please think about the most recently completed school year as you respond to each item.

I use information from digital sources to promote learning and engage students in classroom activities.

Not Usually Sometimes Often Almost always

I require my students to use digital resources and tools for writing, collaboration, reflection, research, and other assignments.

Not Usually Sometimes Often Almost always

I engage my students in real-world issues and authentic problem-solving.

Not Usually Sometimes Often Almost always

I require my students to gather information from sources other than their textbooks in order to complete their daily assignments (e.g., podcasts, videos, etc.)

Not Usually Sometimes Often Almost always

I require my students to present information and actively teach content to their fellow students and/or community members.

Not Usually Sometimes Often Almost always

Section II: Designing and Developing Digital-Age Learning Experiences and Assessments

I use a blend of both face-to -face and online environments to deliver instruction to my students.

Not Usually Sometimes Often Almost always

I design and/or implement projects that emphasize creative thinking and require students to engage in problem-solving, decision-making and experimental inquiry, using digital resources/tools when appropriate.

Not Usually Sometimes Often Almost always

I often design and /or utilize student-centered formative and performance-based assessments using available digital resources and tools (e.g., WV Writes, Acuity, TechSteps, etc.)

Not Usually Sometimes Often Almost always

I use digital resources and tools to make assignments for students that are based upon their individual interests, abilities and learning needs.

Not Usually Sometimes Often Almost always

I require my students to set personal learning goals and to self-assess their progress toward meetings those goals, using digital resources and tools when available and appropriate.

Not Usually Sometimes Often Almost always

Section III: Modeling Digital-Age Work and Learning

I use digital resources and tools to communicate with students.

Not Usually Sometimes Often Almost always

I use digital resources and tools to communicate with my peers.

Not Usually Sometimes Often Almost always

I use digital resources and tools to communicate with parents and the community outside of my school.

Not Usually Sometimes Often Almost always

I customize the available digital resources and tools such as WV Writes (formerly Writing Roadmap), Acuity, TechSteps, etc. to personalize learning for my students.

Not Usually Sometimes Often Almost always

Section IV: Promoting and Modeling Digital Citizenship and Responsibility

I advocate, model and teach my students about safe, legal and ethical use of digital information and technology, including respect for copyright, intellectual property, and the appropriate documentation of sources.

Not Usually Sometimes Often Almost always

I offer students opportunities to use digital resources and tools to participate in collaborative projects with students of other cultures that address current problems, issues or themes.

Not Usually Sometimes Often Almost always

Students in my class model appropriate online behavior and social interaction through digital activities in my classroom.

Not Usually Sometimes Often Almost always

Section V: Engaging in Professional Growth and Leadership

I participate actively in local communities of practice with my fellow teachers, either online or face-to-face.

Not Usually Sometimes Often Almost always

I participate actively in online/global communities with other educators outside of my local community to gather and discuss resources and ideas related to student achievement and learning.

Not Usually Sometimes Often Almost always

I model and teach other educators to use digital tools and resources to promote student achievement and learning.

Not Usually Sometimes Often Almost always

I regularly seek out digital resources, tools and research and evaluate its quality and relevance prior to using it in the classroom.

Not Usually Sometimes Often Almost always

Section VI: Open-Ended Items

What do you think is the role of the SE TIS?

What did you accomplish by working with an SE TIS this year?

Please provide any additional comments you may have about the SE TIS program.

Appendix C. Items and Responses

Table C- 1. Differences in Mean of Pre and Post Survey Items

Item	Item Statement	Pre (2010)		Post (2011)		Significance of difference		Cohen's d effect size	Interpre-tation*
		Mean	SD	Mean	SD	*t*	*p*		
Design1	I use a blend of both face-to-face and online environments to deliver instruction to my students.	2.12	.86	2.53	1.07	-1.80	.07	0.44	Medium effect
Design2	I design and/or implement projects that emphasize creative thinking and require students to engage in problem-solving, decision-making and experimental inquiry, using digital resources/tools when appropriate.	2.53	.81	2.80	.71	-1.56	.12	0.35	Small effect
Design3	I often design and/or utilize student-centered formative and performance-based assessments using available digital resources and tools.	2.45	.76	2.70	.84	-1.34	.19	0.32	Small effect
Design4	I use digital resources and tools to make assignments for students that are based upon their individual interests, abilities and learning needs.	2.35	.77	2.67	.84	-1.67	.10	0.4	Medium effect
Design5	I require my students to set personal learning goals and to self-assess their progress toward meeting those goals, using digital resources and tools when available and appropriate.	2.16	.81	2.67	.92	-2.51	.02*	0.61	Medium effect
Model1	I use digital resources and tools to communicate with students.	2.22	.92	2.62	.82	-2.03	.05	0.46	Medium effect
Model2	I use digital resources and tools to communicate with my peers.	2.78	.97	2.90	.80	-0.60	.55	0.13	Negligible effect
Model3	I use digital resources and tools to communicate with parents and the community outside of my school.	2.67	.86	2.73	.74	-0.37	.71	0.08	Negligible effect
Model4	I customize the available digital resources and tools such as WV Writes (formerly Writing Roadmap), Acuity, TechSteps, etc. to personalize learning for my students.	2.39	.95	2.69	1.04	-1.27	.21	0.31	Small effect

Table C- 1 Differences in Mean of Pre and Post Survey Items, continued

		Pre (2010)		Post (2011)		Significance of difference		Cohen's d effect	
Item	Item Statement	Mean	SD	Mean	SD	*t*	*p*	size	Interpre-tation*
Engage1	I participate actively in local communities of practice with my fellow teachers, either online or face-to-face.	2.64	.90	2.90	.82	-1.30	.20	0.3	Small effect
Engage2	I participate actively in online/ global communities with other educators outside of my local community to gather and discuss resources and ideas related to student achievement and learning.	1.88	.85	2.31	.81	-2.24	.02*	0.52	Medium effect
Engage3	I model and teach other educators to use digital tools and resources to promote student achievement and learning.	1.94	.94	2.17	.89	-1.10	.28	0.26	Small effect
Engage4	I regularly seek out digital resources, tools and research and evaluate its quality and relevance prior to using it in the classroom.	2.38	.99	2.72	.88	-1.60	.12	0.37	Small effect
Promote1	I advocate, model and teach my students about safe, legal and ethical use of digital information and technology, including respect for copyright, intellectual property, and the appropriate documentation of sources.	3.00	.85	3.17	.79	-0.89	.38	0.2	Small effect
Promote2	I offer students opportunities to use digital resources and tools to participate in collaborative projects with students of other cultures that address current problems, issues or themes.	2.02	.88	2.40	1.04	-1.68	.10	0.41	Medium effect
Promote3	Students in my class model appropriate online behavior and social interaction through digital activities in my classroom.	3.08	.94	3.20	.81	-0.60	.22	0.14	Negligible effect
Facilitate1	I use information from digital sources to promote learning and engage students in classroom activities.	2.45	.73	2.90	.80	-2.51	.02*	0.6	Medium effect
Facilitate2	I require my students to use digital resources and tools for writing, collaboration, reflection, research, and other assignments.	2.16	.88	2.59	.95	-2.00	.05	0.48	Medium effect

Table C- 1 Differences in Mean of Pre and Post Survey Items, continued

		Pre (2010)		Post (2011)		Significance of difference		Cohen's d effect	
Item	Item Statement	Mean	SD	Mean	SD	*t*	*p*	size	Interpre-tation*
Facilitate3	I engage my students in real-world issues and authentic problem-solving.	2.94	.81	3.07	.74	-0.71	.48	0.16	Small effect
Facilitate4	I require my students to gather information from sources other than their textbooks in order to complete their daily assignments.	2.35	1.04	2.80	.85	-2.10	.04*	0.47	Medium effect
Facilitate5	I require my students to present information and actively teach content to their fellow students and/or community members.	2.33	.89	2.53	.82	-1.03	.31	0.23	Small effect

GLOBAL21

Students deserve it • The world demands it

West Virginia Department of EDUCATION

Jorea M. Marple, Ed.D.
State Superintendent of Schools