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### Tech EDGE, Use of New Literacies in Elementary Classrooms Today: A Partnership to Enhance Student Learning through Teacher Preparation and Professional Development

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IMPROVING TEACHER QUALITY GRANT: STATE GRANT PROGRAM

Tech EDGE

Use of New Literacies in Elementary Classrooms Today: A Partnership to Enhance  
Student Learning through Teacher Preparation and Professional Development

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## Executive Summary

- The grant carried out all planned activities. Teachers participated in person and through distance technologies.
- Professional development activities, including iPads in the Classroom webcasts and archived conference presentations, are open to all Nebraska teachers through YouTube and iTunesU channels.
- Lessons were also disseminated in local and national conferences
- Growth in pre-service self-efficacy in technology integration has grown to a large degree.
- Classroom observations showed that teachers planned instruction that included embedded technology skills and effective use of technology.
- Students were observed using ethical behavior, high on-task behavior and engagement.
- Scores in problem solving and other learning were higher for upper elementary students.
- Problem solving, collaboration and student tool choice are areas for additional focus.
- Teachers are still challenged by the global opportunities possible with new technologies.
- Teachers express need for additional professional development to keep up with new technologies and opportunities that would impact student achievement.
- Coaching has emerged as the most promising practice pushing pre- and inservice teachers to integrate technologies into classroom learning quickly and thoughtfully.

## Summary of Activities

### Online survey of technology integration

Online surveys of technology integration were conducted in spring 2011 and repeated in spring 2013. In spring 2011 we had 309 respondents to the survey, in spring 2013 there were 341 respondents to the survey. The results of the surveys are shown in the Outcomes section.

### Online survey of knowledge for preservice teachers

The Technology Integration Survey was developed in spring 2011 and implemented in fall 2011. A second round of surveys was conducted in spring 2013 to show the impact on student teachers in the programs. There were 92 responses to the pre-Technology Integration Survey in 2011. There were 84 responses to the post-Technology Integration Survey in 2013

### Interviews and observations

Coaching of five student teacher/cooperating teacher dyads was conducted in fall 2012. Eighteen one-hour observations were conducted in classrooms. Ten half-hour interviews were conducted with student teachers and cooperating teachers separately and five interviews were conducted together in dyads, for a total of fifteen interviews. Forty one-hour weekly coaching visits were conducted with dyads over the semester. Overall, more than 65 contact hours were invested into the interview and observation phase of coaching.

### Professional development days

Seven Technology Education in Digital and Global Environments (Tech EDGE) Conferences were held on the University of Nebraska campus and one conference was conducted in Banner County. A combination of classroom teachers, university instructors, students, and educational technology personnel led hands-on presentations on ways to integrate technology in the classroom. Descriptions of each conference follow.

#### **Four Tech EDGE conferences were held specifically for elementary teachers, principals, and student teachers (see Appendix A for brochures listing each presentation and presenter information):**

(1) 3/7/2012 had 210 participants

This conference offered 18 presentations plus round table sectionals following. There were 20 presenters who were elementary teachers, media specialists, a technology coach, university professors, and graduate students.

(2) 6/12/2012 had 152 participants

This conference offered 19 presentations by 20 elementary teachers, media specialists, educational technology personnel, university professors and graduate students.

(3) 9/10/2012 had 97 participants

This conference offered 17 presentations by 17 elementary teachers, university professors, undergraduate students whom we had coached, graduate students, district media specialists, and State Department of Education personnel.

(4) 1/28/2013 had 163 participants

This conference offered 16 presentations by 20 presenters including four of the cooperating teacher/student teacher dyads who were coached in the fall, additional elementary teachers, media specialists, graduate students, and university personnel.

**One Tech EDGE conference was held specifically for university instructors from Concordia University, University of Nebraska-Lincoln, and other teacher preparation colleges across Nebraska (see Appendix B).**

(5) 8/14/2012 had 94 participants

Thirty-one presentations were offered at this conference by 30 university professors, educational technology specialists, media specialists, graduate students, and State Department of Education personnel.

**One Tech EDGE conference was held on UNL's campus specifically for the student teacher/cooperating teacher dyads receiving coaching fall 2012.**

(6) 11/2/2012 had 10 participants

Nine presentations were presented to create a learning community for the five dyads participating in the study because they teach at four different elementary schools. This was a way to present the same information to all dyads at the same time and answer questions they may have. Each dyad was asked to present one way they were integrating technology into their teaching. The following sectionals were presented by Guy Trainin and Laurie Friedrich: Technology Survey, & Introductions, Creating an ebook using iBooks Author, Creating graphs using Google Docs Spreadsheet, Technology troubleshooting & answers to app/technology requests, Scoring Student Technology Project Rubrics, Dyads sharing technology use ideas, Introduction to Edmodo and signing up for an account, New Literacies discussion, Sharing new apps, and Coaching comments.

**One Tech EDGE meeting was held in Banner County to meet the needs of this partner school where distance made it difficult for teachers to attend in person in Lincoln (some did attend online in other conferences as well):**

(7) 1/10/2013 held in Banner County with 15 participants

Seven presentations were created to meet the specific needs of the teachers at Banner County School and presented by Guy Trainin, Laurie Friedrich, and Jason Wilmot (4<sup>th</sup> grade teacher who participated in Dyad coaching fall 2012): Elementary Education in the 21<sup>st</sup> Century, Technology Integration by a 4<sup>th</sup> Grade Teacher: What is the process for students and teacher?, How does Technology Integration fit with my curriculum: Technology standards and evaluation rubrics, Sharing favorite Apps, iPad Play Time–Demonstration of iPads and apps we brought along for teachers to use, Join a 2<sup>nd</sup> grade class in Lincoln via Skype to see what technology integration looks like, and Great websites for teaching! We concluded with Focused plan time

assisting teachers in planning one technology idea they would like to implement into their teaching in the next 7-10 days. How can we help?

**Table 1: Summary of Professional Development Events**

Number	Date	Audience	Number of Presentations	Number of Attendees
1	3/7/2012	Elementary in- and pre-service teachers	17	210
2	6/12/2012		18	152
3	9/10/2012		16	97
4	1/28/2013		16	163
5	8/14/2012	Teacher Educators	30	94
6	11/2/2012	Tech EDGE Dyads	9	10
7	1/9/2013	Banner County Elementary Teachers	8	15

**Creating professional development videos**

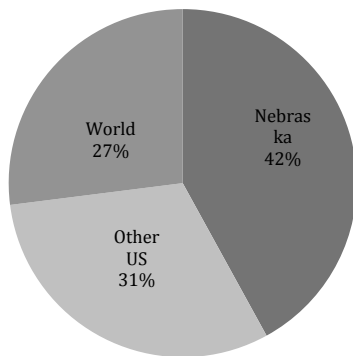
Professional development videos are distributed using multiple channels. The video originates on UNL servers, from there it feeds to a YouTube channel for Tech EDGE and an iTunesU course. We use multiple social media channels (Twitter, Facebook, LinkedIn) to distribute the professional development content across Nebraska, the US and the world. We currently have 100 movies uploaded. Sixty-three are iPads in the Classroom episodes; the others are relevant presentations and interviews.

**Table 2: Viewership of Tech EDGE Professional Development Videos**

Source	Downloads	Streams	Total*	Subscribers
UNL Media Hub	NA	890	890	NA
YouTube	NA	3993	3993	43
iTunesU	3746	2680	6426	883
<b>Total</b>	<b>3746</b>	<b>7563</b>	<b>11309</b>	<b>926</b>

Note: \*Totals are of downloads and streaming only, results are as of April 25<sup>th</sup>

Detailed analytics are available for the YouTube channel only. They reveal that the viewership is 55.4% women predominantly from Nebraska and the US.



**Figure 1: Viewership location**

## Outcomes

### Observation Protocol for Technology Integration in the Classroom (OPTIC)

The OPTIC protocol (Northwest Regional Educational Laboratory, 2004, <http://www.netc.org/images/pdf/observation.rubric.pdf>) was completed during or immediately following the 18 observations to look at level of student involvement or proficiency in technology integration during classroom lessons. Each lesson was scored on eleven categories: students choosing the technologies appropriate to their learning objectives (Choice), students involved with teacher and peers in planning for use of technology in a lesson (Planning), group activities using technology with collaboration (Collaboration), students acting ethically using technology (Ethical Practice), students exhibiting skill using technologies at grade level (Effective Use), students focused on curricular objectives (On Task), technology skills embedded and learned in context of core curriculum (Tech Skills Embedded), problem solving and higher order thinking evident in student activities (Problem Solving), student engagement in use of technology (Engagement), student use of technology based on cognitive ability and physical needs (Developmentally Appropriate), and student use of technology for learning that could not otherwise be easily done (Value Added). Each category was scored on a scale from 1 to 5, where 1 represented beginning levels of the attribute and 5 represented more advanced levels of the attribute measured. Some areas measured were not part of the lesson observed so were marked Not Applicable in this situation and were not included in mean calculations.

### Technology available in schools

Surveys were sent to all teachers in participating schools and teacher education programs. The online survey was sent in April 2011 and again in March 2013.

Respondents to the April 2011 pre-survey were 89% women in-service teachers with an average of 16 years of teaching experience. 55% of teachers had a pre-service teacher in their classrooms. Key results showed that technology availability was divided into three categories: universal devices that are available in every classroom or almost every classroom, available technologies that are available at the school level but need to be brought into classrooms, and local technologies that are school specific. An example of local technologies would be schools that have purchased interactive whiteboards and use them, but they are not equally distributed between schools.

In 2011 universal equipment included teacher computers, Internet access, and LCD projectors. In 2013 document cameras were added to this list.

In 2011 technology available at schools included student laptops and different camera devices (flip, camcorders, digital cameras). In 2013 student desktop computers shifted from universal devices to available devices probably signaling a shift to mobile technologies.

In 2011 school specific local devices included interactive whiteboards, iPods, iPads, Clickers, and ebooks. This category has changed in 2013 with Clickers and ebooks almost disappearing and iPods and iPads doubling in classroom penetration.

In 2011 teachers noted three areas for training: (1) multimedia including presentation and video applications; (2) web authoring including creating websites, blogs, podcasts, and using Google docs; and finally (3) electronic communication including teleconferencing, electronic Pen Pals, and virtual fieldtrips. These were the topics for which we tried to provide sectionals in the Tech EDGE conferences.

## Teacher Training Needs K6

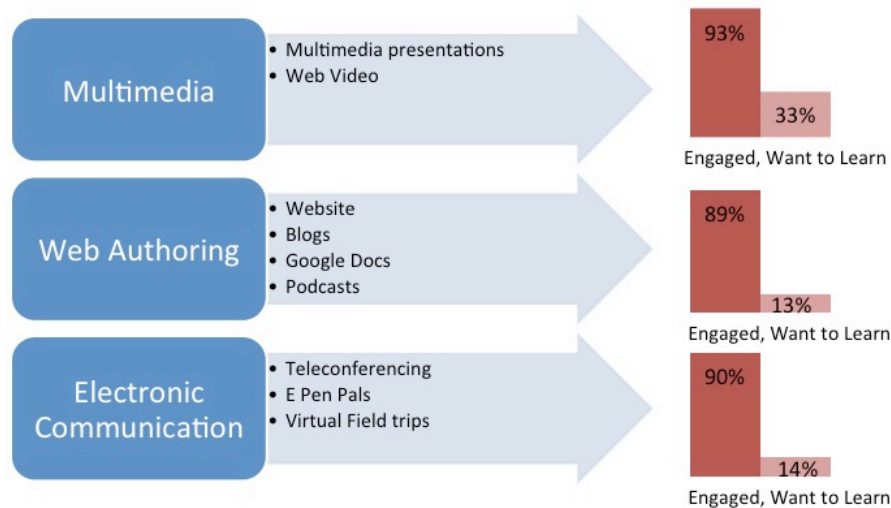


Figure 2: Teacher Training Needs Spring 2011

### Profile of elementary teachers

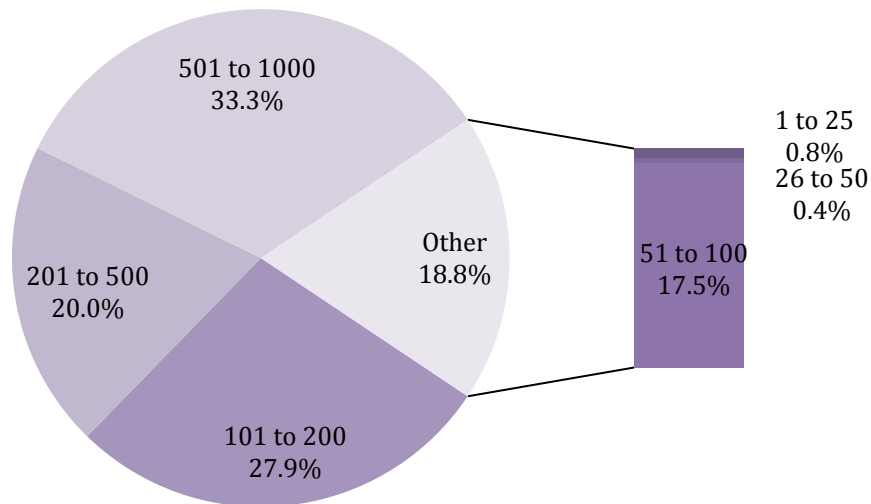
Participating teachers were 91.6% White non-Hispanic, 2.5% Hispanic, 1.5% African American, .7% Asian/Pacific Islander, and 2.5% Other. Fifteen percent of teachers taught in rural schools and 85% in town or city. 65% of teachers were from public schools and 35% were from private schools. Distribution of school size is presented in figure 3. From the information included, about 20% of participants came from small schools of up to 100 students, about 20% came from schools over 500 students.

### Profile of preservice teachers

Participating preservice teachers were 94.6% White non-Hispanic, 2.7% Asian/Pacific Islander, 2% Hispanic, and .7% African American. 10.7% (n=28) were male and 89.3% (n=234) were female.



Figure 3: School Size



### Profile of university instructors

Participating university instructors were 91.7% White non-Hispanic, 1.2% Asian/Pacific Islander, 6% Hispanic, and 1.2% African American. 54.7% were male (n=47) and 45.3% were female (n=39). Years of experience for university instructors attending Tech EDGE conferences was as follows: 1.2% first year teaching, 1.2% second year teaching, 5.8% three to five years teaching, 23.3% six to ten years teaching, 21% eleven to twenty years teaching, and 48% twenty plus years of teaching.

### Quantity and quality of integration in elementary classrooms

We used the Observation Protocol for Technology in the Classroom (OPTIC, 2004) to observe eighteen lessons in five classrooms over a six-week period. Results in table 3 show that overall primary classrooms have lower mean scores than intermediate grades. For both primary and intermediate the highest scores were in the areas of Ethical Practice, On Task, Engagement, and Tech Skills Embedded. (1) When observed, students were using technology responsibly and safely especially when using the Internet to locate information. In one lesson a teacher taught digital citizenship using the district poster as a guide for students. (2) Students were on task, focused on the intended curricular objectives of the lesson. One teacher challenged his students to create a video demonstrating their process of working three math problems. Students focused on the task of solving the problems and went beyond to explain their thinking process by recording their voice in the video. (3) Most students were highly engaged in the use of technology to learn. Students were creating eBooks using the iPad provided to the dyad during coaching. They used a “voice to text” app to get their story down, edited the story, then cut and pasted the text into the eBook format. They enjoyed locating pictures to insert into the eBook to further add detail to their writing. (4) And finally, teachers embedded specific technology skills within the context of the core curriculum so students

learned these additional 21<sup>st</sup> century skills right along with lesson objectives. A kindergarten teacher taught students how to log into the computer, insert passwords, and use Google Images within a lesson to create an online presentation of the word family they were studying.

**Table 3: Observation Protocol for Technology in the Classroom Descriptive Statistics**

	Primary	Intermediate	Overall	Max
<b>Teacher Design</b>				
Tech Skills Embedded	3.89	4.83	4.27	5
Effective Use	3.88	4.0	3.93	5
Developmentally Appropriate	3.11	4.5	3.67	5
Value Added	2.45	3.00	2.65	5
<b>Student Behavior</b>				
Ethical Practice	5.00	4.67	4.83	5
On Task	4.56	4.83	4.67	5
Engagement	3.55	4.33	3.82	5
Problem Solving	2.40	3.50	2.81	5
Collaboration	2.14	2.67	2.38	3
Planning	1.20	1.67	1.38	3
Choice	1.10	1.40	1.20	3
Overall Score	2.80	3.61	3.09	4.27

Note: OPTIC Items were renamed to better represent the constructs

Three areas where both primary and intermediate classrooms scored lowest were Choice, Planning, and Collaboration. In each of these areas the maximum score was 3 out of a possible 5. This shows that the teachers in most of these classrooms are choosing the technologies and uses to meet learning objectives, with little involvement by students in the selection process. Although students helped each other, most projects were completed individually rather than in collaborative groups. These are areas for further research and professional development.

### Quantity and quality of integration in preservice teachers

We used the Technology Integration Survey to examine preservice teachers' ability to integrate technology in their teaching. The Survey included four main sections. In the first section, students reported on their self-efficacy to use technology. This section had ten items including "I can learn new technologies easily" and negative ones such as "I often need help getting my technology going." In the second section students reported about their competence in designing and teaching technology-integrated lessons and the frequency of such lessons. In the third section students reported which university classes modeled technology integration most effectively. And in the fourth section students were asked to respond in writing describing the most effective lesson.

The self-efficacy survey was highly reliable and included only one factor. Self-efficacy was high with a mean score of 3.8 out of 5 possible. The highest confidence items were "I can learn new technologies easily" (4.16) and "I have the technical skills I need to teach well" (4.07). The lowest item was "Colleagues often ask me to

help them with technology” (3.37) which is still a positive response and may have more to do with students being inexperienced in teaching.

Confidence in integrating technology in lessons was fairly high in all areas. Literacy and Math had somewhat higher frequency and confidence. The opportunity to teach in Math and in Literacy is considerably more frequent in practicums and schools, which may explain why students have more confidence in using technology in these areas. Practice does increase efficacy.

**Table 4: Efficacy and Frequency of Technology Integration by Subject**

	Efficacy (1-5) 1=Highly Ineffective 5=Highly Effective	Frequency (1-4) 1=Never 4=In All Lessons
Literacy	3.95 (.87)	2.40 (.62)
Math	3.91 (1.0)	2.50 (.79)
Science	3.74 (.86)	2.10 (.71)
Social Studies	3.71 (.91)	2.10 (.74)

### Growth in technology use in preservice teachers

One of the main thrusts of this grant is to improve the ability of future teachers ability to integrate technology into their lesson. Using the results of the Technology Pedagogical Content Knowledge survey it is clear that students graduating in 2013 are better equipped to integrate technology. The effect size is very large for most areas and a bit lower for science and social studies lessons. The lower results for science and social studies may be a result of fewer opportunities to teach in these areas regardless of technology needs. The full results are in Table 5 below. The average effect size is 2.09 a large effect size in line with our goals but considerably beyond the expectations in the grant proposal.

This positive result is a clear indication that the approach of improving the quality of technology integration in Teacher Education, hand in hand with changes in technology integration in schools had a multiplicative effect on outcomes!

**Table 5: Technology Integration by Cohort**

	Elementary Graduates 2011 Mean (SD)	Elementary Graduates 2013 Mean (SD)	Effect Size
Literacy & Technology	1.79 (.74)	3.95 (.87)	2.48
Math & Technology	1.75 (.62)	3.91 (1.02)	2.12
Science & Technology	2.11 (.89)	3.74 (.86)	1.92
Social Stud. and Technology	2.04 (.98)	3.71 (.91)	1.84

### Professional presentations – national

In the proposal we guaranteed two presentations to disseminate our results and lessons learnt. We succeeded in disseminating to Nebraska audiences twice and added a national presentation.

Trainin, G., & Friedrich, L. A. (2012, November). Coaching New Literacies with Student Teacher/Cooperating Teacher Dyads in Elementary Schools. Paper presented at the Annual Meeting of the Literacy Research Association (LRA), San Diego, CA.

The purpose of this study was to understand how student teacher/cooperating teacher dyads integrate new literacies into their teaching with the support of a coach. To explore the uses of new literacies, the researchers formed a state-wide partnership of eight elementary school districts and two teacher education programs. Learning best practices and necessary technology skills suggested by skilled practitioners, student teacher/cooperating teacher dyads from these partner schools integrated new literacies into their teaching with the support of a coach.

#### Professional presentations – regional

Trainin, G., & Friedrich, L. A. (2013, April). Mobile Devices in with Exceptional Students: Recommended Apps for Exceptional Learners. Paper presented at the Nebraska Educational Technology Association (NETA), Omaha, NE.

In this session we shared the top mobile apps for teaching Exceptional students in the mainstream classroom and in pull out. Our emphasis was on ways to engage, differentiate, and accelerate learning. The presentation was based on our work during the last 3 years researching and experimenting with mobile apps at the UNL Reading Center and as part of Tech EDGE. The presentation included the student samples, and teaching ideas.

Trainin, G., & Friedrich, L. A. (2013, February). iPads in the Classroom. Paper presented at the Annual Meeting of the Nebraska State Reading Association, Kearney, NE.

The purpose of this presentation was to inspire attendees to dream and celebrate the future of education through effective integration of iPads for teaching and learning. We integrated research results with best practices from the UNL Reading Center.