NEXT GENERATION EDUCATION

Implications For Technical Communicators

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ABSTRACT

The revolution has arrived. Technology is advancing, the classroom is evolving, and the role of the technical communicator is shifting. With all of these changes, the next generation has great potential for their educational experience. How might technical communicators play a role in developing the future of our society through these next generation students? This study documents the shift in the educational paradigm due to technological advancements, analyses the future of learning technologies, and examines methods of teaching and learning with specific attention to the role of the technical communicator. The objective is to understand how the role of the technical communicator has and will change, add value to learning technologies, and mediate gaps in terms of developing and implementing learning technologies. As a whole, this project provides insight into the overlap of emerging technologies, classroom education, and technical communication.

Keywords: education, learning technologies, emerging technologies, K-12, technical communication, next generation
INTRODUCTION

As the second oldest of eight children, my family provides witness to the digital divide between generations. As part of a new generation, Generation Z, my youngest sister (a mere ten years younger than I) is learning in completely different ways than older family members. The development of new technologies is evolving the ecosystem of education. Today’s students have new tools at their fingertips: from 1:1 ratios with tablets and laptops, to augmented and virtual reality, to smart devices (such as smartphones and SMARTboards), to educational games/apps, and so much more. With a continuous pedagogical shift spurred by emerging technologies, teachers, students, designers, engineers, developers, parents, and many more must adapt. But the question remains: who is best positioned to help people adapt?

This study investigates implications for technical communicators within education. The objective is to understand how the role of the technical communicator has and will change, add value to learning technologies, outline issues, and mediate gaps in terms of developing and implementing learning technologies. The study will (1) document the shift in the educational paradigm due to technological advancements, (2) look at expectations for the future of learning technologies, and (3) examine methods of teaching and learning with specific attention to the role of the technical communicator. Ultimately, this project will provide insight into the overlap of emerging technologies, classroom education, and technical communication (Figure 1).

Figure 1: The role of the technical communicator related to the overlap of emerging technologies and classroom education
Many years ago, Alvin Toffler (1974), futurist and digital revolutionist, pointed out: "All education springs from some image of the future. If the image of the future held by society is grossly inaccurate, its education system will betray its youth" (p. 3). With that, this project will look specifically at elementary education. Students at this level are at the forefront of new learning technologies and will shape the future of our society.

According to Sir Ken Robinson (2010), a revolutionist in transforming the culture of education and organizations with a richer conception of human creativity and intelligence, the modern education system was designed for, conceived in, and structured for a different age. Until relatively recently, knowledge and information was being “fed” into the students through text- and lecture-heavy methods to meet curriculum requirements and testing standards (often referred to as the ‘industrial model’ of education) rather than working to bring out students’ full potential (Rathnam, 2015; Robinson, 2010; Wiliam, 2011). Over the course of the last few decades, a series of educational reforms have been implemented across much of the developed world, including financial resources, additional training, teacher:student ratios, emphasis on standardized testing, classroom structure and curriculum requirements, and more (Hargreaves & Shirley, 2012; OECD, 2013; Earl and Katz, 2007; Martin, 2015). Technology has allowed this revolution to occur: education is changing.

The delivery of education today includes computer-enriched learning environments, a focus on learning spaces, technological integration, and personalized learning (Mitra & Steffensmeier, 2000; Ariani, 2015; McLaughlin & Lee 2010; Martin, 2015). Among others, research from Black and Wiliam (1998), Dweck (2006), and Hattie (2012) has developed perspective and understanding that, given the right environment, all children can and do learn. As visual learning begins to play a more vital role in modern education, emerging technologies in the classroom are challenging and expanding graphics, animation, device usage, comprehension, sensory channels, memory, and student interest (Kellner, 2000; Lai, 2001; Anderson, 2001; Schnottz, 2002; Sankey and Nooriafshar, 2005). As technologies provide potential to impact learning in significant ways, both the classroom and the role of the technical communicator are altering and involving more interdisciplinary areas (Swanson et al., 2018;
Whiteside, 2003). All of these lines are beginning to cross: the future holds great promise for teachers, the classroom, students, emerging technologies, and technical communicators.

**THIS STUDY**

This paper is divided into three sections: (1) The Shift in Education, (2) Emerging Technologies in the Classroom, and (3) Implications for Technical Communication. Each section provides insight to the central questions of the study, which include the following:

- How have K-12 learning experiences shifted since the invention of the computer?
- What can we expect for the future of classroom technology?
- What are the implications for technical communicators?

These three questions remain broad in order to facilitate continuous discussion as technology, education, and technical communicator’s roles continue to evolve.

To investigate the above questions, I held semi-structured interviews with seven people related to one of the following fields: education/educational psychology, learning technologies, and technical communication. Job titles varied, including elementary teacher (and former K-12 teachers), K-12 media specialist, technical communicator, professor of computer science, and learning technology specialist. For each individual, I sent out an email containing a variation of the email found in the Appendix (the only alteration was specifying why I selected the individual to participate).

During the interview, the three core questions listed above acted as the main facilitators for our conversation. As interviewees brought forth insight and perspective, additional open-ended conversation questions were added, leaving room for stories and unbiased responses (i.e. “tell me more about that experience”; “what were some challenges you faced?”; “how do you see this playing a role or changing in the next 5-10 years?”). Four of the conversations were held face-to-face; three were held over the phone. During each conversation, I took handwritten notes for my future reference. I aimed to audio-record each conversation for the purpose of my personal reference to our conversation as I compared results. However, due to technological difficulties (I reached a recording limit on my mobile device), only three of the conversations were fully audio-recorded.
In addition to talking with experts, I attempted to reach out to three local education-oriented institutions to observe the process of developing learning technologies. Unfortunately, I was turned away from one and never received a response from the other two, despite reaching out twice. However, this information was substituted through additional research in scholarly articles and online content. Many of the resources were found through the University of Minnesota’s library database using the following search terms:

- Pedagogy AND Technology
- Classroom AND Technology
- Education AND Technology
- Pedagogy AND “Emerging Technology”
- Classroom AND “Emerging Technology”
- Education AND “Emerging Technology”
- “Emerging Technology” AND “Technical Communication”
- “Emerging Technology” AND “Technical Communication” AND Education
- Generation Z Education
- Study on interactive learning

Several resources, including online articles and related websites and organizations, such as Educause and KnowledgeWorks, were provided by my advisor, Dr. Ann Hill Duin. Other web-based resources were located through the hashtags #EduTech and #K12 as well as through recommendations provided by interviewees. As I read through these resources, I highlighted key quotes to use within my paper as well as other references to look into as additional sources. In reviewing scholarly work, I used a color-coding method: yellow was used for information I found interesting and could be relevant to this study; blue highlighted areas I strongly saw fit to include within my paper (these quotes were copied and placed into a document, separated by subject: Shift in Education, Emerging Technologies, and Implications for Technical Communicators); red highlighted references within the scholarly work that I wanted to look into myself.

These methods allowed me to collect insightful information and data to properly discuss implications for technical communication in the field of education in regards to emerging
technologies. To begin, the first section, *The Shift in Education*, discusses how education has changed over the years and the role technology has played. Section two, *Emerging Technologies*, generates a list of technology genres commonly used and increasing in prevalence in today’s classroom settings. The final section, *Implications for Technical Communication*, provides insight to (1) the traditional role of the technical communicator, (2) the overlap of emerging technologies, classroom education, and technical communication, (3) the new role, and (4) the future of the field.

**SECTION 1: THE SHIFT IN EDUCATION**

It’s 1973. He sits at his steel-and-chrome desk—this boy who grew to become my father—in a central-Iowa elementary school classroom. The room is bare; nothing on the walls besides a few posters and some crafts the kids created for the holiday season. The desks are aligned in rows, all facing the front of the room, away from any windows. The students just turned in their hand-written essays on the Inca civilization, of which the class learned about through lectures, their textbook, and trips to the library. Moving into a new category of history, a map is displayed on the overhead projector and a printed handout is being passed around as the teacher writes a series of names and dates on the chalkboard. The boy stares at the clock above the chalkboard, bored out of his mind, anxiously awaiting recess. The teacher then rolls in a TV cart. The lecture suddenly becomes less mundane: *Yes*, he thinks, *we could burn some time with this!*

Jump ahead to 2008: this boy’s daughter (myself) sits in a classroom in the same building. We have moved beyond the chalk and adapted to white, dry-erase boards. The desks are now set in clustered groups as we participate in collaborative projects. The walls are covered with colorful educational posters, encouraging phrases, and bulletin boards filled with our projects. The teacher gives her lesson, using a newer variation of the overhead projector: the ELMO. Something else has also emerged: the computer. Occasionally, a special trip will be made to the media center to play some educational games or to learn how to find books and do research. But on this day, a large laptop cart reserved from the media center sits off to the side in the classroom, holding about thirty white Apple laptops for each student to use during the class period. In an orderly fashion, we check out computers and sit at our desks, typing slowly but
steadily into the internet browser’s search bar for project research. In contrast to the typewriters and old-school computers used before us, we have quick and easy access to a whole world of information. We then use Microsoft Word to type up our papers, using tools like spell-check to correct our errors. The delete button has become the new eraser; printed books from the library are slowly becoming obsolete.

Skip ahead a decade: the 2018 classroom. A new school building has risen on the same plot of land and my youngest sister attends. The surrounding windows are large, generating a bright environment connected to the world outside instead of sheltering students away. Each child sits at their rolling desk, making it easier for students to shift around and re-group throughout the day. They each have their own computer/tablet to use at school and home, provided to them by the school district. The teacher has shared her classroom presentation with the students electronically via Google Classroom so they can access the content whenever they need it. The students do their work online—from research to writing to sharing and interacting. Video and images have taken place of reading long articles; textbooks are skimmed; Google provides instant answers rather than having to flip through indexes of books; apps are frequently used during the lesson, providing students with extra assistance as well as some educational entertainment. Textbooks are filled with images and charts, some of which provide an augmented reality option, allowing students to use their smart devices to scan and interact with with content. They have access to 3D printers and computer-aided-design programs, the chance to experiment with robots, and opportunities to travel in virtual environments. This little girl is learning in much different ways than her father and older sister did before her. She is part of the next generation: Generation Z.

In comparison to previous generations, this group has rich, diverse, and unique learning experiences at their fingertips. Surrounded with a highly sophisticated media and computer environment, emerging classroom technologies are providing students from this generation with accelerated achievement opportunities. As we begin to better understand the brain, learning environments, and advancing technology, the shift in education will only continue to stretch as it reflects learner’s needs, interests, and goals.
Over the years, research has provided key findings in the world of education:

1. **Space matters**: “the space created during the learning activities is considered as an important element in the learning process. And the essence of a learning space is the interaction between persons and the setting within which they are engaged” (Ariani, 2015, p. 179).

2. **People are interactive learners**: “students do not touch, see, or hear passively; they feel, look, and listen actively” (Graetz, 2006).

3. **Various learning styles exist**: Sarasin (1999) classifies a learning style as "basically the preference or predisposition of an individual to perceive and process information in a particular way or combination of ways" (p. 3); a study conducted by Liu and Ginther (1999) in the United States of America found that approximately 20-30% of students were auditory learners; about 40% visual; while the remaining 30-40% either tactual/kinesthetic, visual/tactual, or some combinations of the above.

4. **Technology is key to creating an active, adaptive learning space**: “The use of the technology enables the learner to immerse in an environment that allows for learning through an increased range of sensory experience, which can potentially deepen understanding” (3D Immersive and Interactive Learning, 2013, p. V); It is imperative that "instructional materials, as well as teaching styles, should be matched with cognitive styles for greatest learner benefits” (Stokes, 2002, p. 12).

Since the invention of the computer, many pedagogical changes have been able to be implemented to adapt to these research findings. The progress of computer and web tool developments has greatly altered our society as well as our education system:

The introduction of the Internet into our conscious environment brought about a transformation in the way we communicate, making it possible to exchange information and acquire knowledge with little practical delays. While this represented a tremendous increase in efficiency, it was not until the advent of
Web 2.0 tools, which allowed for greater interactivity and enhanced online collaboration capability, that a new frontier was reached. Such tools fundamentally alter the ways in which we interact, and more importantly, they extend the connectivity for each individual to not just sources of knowledge, but also sources of expertise. A carefully structured connectivity sphere can then allow the individual to have access to a range of diverse and enriching interactions that was not possible before. When led by pedagogically sound designs, Web 2.0 tools can be meaningfully weaved into teaching and learning environment to greatly enhance the educational journey of a learner (3D Immersive and Interactive Learning, 2013, p. V).

A RETURN TO THE VISUAL: A HISTORICIZATION

As mentioned before, research by Liu and Ginther (1999) found that approximately 40% of students are visual learners, 20-30% auditory, and 30-40% either tactual/kinesthetic, visual/tactual, or some combinations of the above. In contrast to classrooms 20 years ago, new technologies—as well as a call for educational reforms—have lead many modern classrooms to become more visual. But the human success with visual learning is not a new concept, we have simply been reminded of its effectiveness.

Aristotle stated that, “without image, thinking is impossible” (as cited in Benson, 1997, p. 141). Looking historically, many of the first stories and thoughts were recorded through visual symbols. As written language developed, characters became pictures with associated meanings. With the increased value of stories within society, art flourished and visuals became vital. Then, the creation of the printing press in 1440 allowed for the first separation of illustration and type. The development of the formal education system lead to emphasis in literacy while the importance of the visual fell to the side. For a long time, education revolved around a strict text-based curriculum. Slowly, images became more frequently incorporated into textbooks. As time went on and technologies such as the television emerged, educational movie programs became acceptable in the classroom. Then, computer games increased in prevalence. Today, many more visual and interactive elements are part of the system. We have grown to realize the
importance and effectiveness of the visual: “As history repeats itself, we may find that a great deal of information is better presented visually rather than verbally” (Stokes, 2002, p. 11).

Visual, interactive elements are vital for a student’s learning process: “Research reported in educational literature suggests that using visuals in teaching results in a greater degree of learning” (Stokes, 2002, p. 10); ”students learn better from words and pictures than from words alone” (Doolittle, 2002, p. 1). These visual elements allow the classroom to “become a place where students love to learn, a place they seek out when they wish to learn, and a place they remember fondly when they reflect on their learning experiences” (Ariani, 2015, p. 183). But what technologies are enabling this interactive style of learning?

SECTION 2: EMERGING TECHNOLOGIES IN THE CLASSROOM

The learning ecosystem is evolving. “As studies show success in thinking and learning visually instead of or in addition to traditional lectures and verbal description” (Stokes, 2002, p. 14), the classroom has adapted to incorporate new learning opportunities through multiple modes (i.e “...linguistic/textual, visual/graphical, musical/audio, spatial, gestural... sometimes all operating simultaneously” (O’Rourke, 2002, p. 57)). Technology opens the doors to these opportunities and assists in advancing education across the spectrum of learning styles: “According to neuroscience and the Universal Design for Learning (UDL) theory, there is no one right way to learn. Fortunately, numerous tech tools offers a variety of ways for all students to engage, receive information and express their learning” (ISTE, 2018).

Clearly, technological tools are beneficial to have in the classroom. What can we expect for the future and how will the technical communicator be involved? Through interviewing conversations, common overlap in genres for emerging classroom technology became evident:

- Online videos and games
- Organization tools
- Augmented realities
- Virtual realities
- Wearables
ONLINE VIDEOS AND GAMES

Dr. Konstan, Professor of Computer Science and Engineering at the University of Minnesota, spoke with me about computers in education on February 22, 2018. He noted that online teaching material “brings a different way of teaching for a generation that has not been as textbook centered.” He commented that computers offer more projection and ability to do things, and that online videos have especially become prevalent for learning (take Khan Academy, for example). Online videos provide additional resources, they’re simple to make, and they provide an alternative form of learning (compared to simply reading a textbook or listening to a lecture).

In addition, mobile applications have become a prevalent aspect of learning. Take a look at the Tech Edvocate’s 2018 List of 116 of the Best Teaching and Learning Apps, for instance. There are so many options, the list is almost overwhelming. Tied to these games are other computer-driven technologies, including robots like Sphero and 3D printing. During our discussion on April 11, 2018, Dr. Scharber, a former middle and high school teacher and current Associate Professor at the University of Minnesota’s Learning Technologies Media Lab, pointed out that many of today’s students are gaining coding literacy from a young age because of their involvement with robotics, applications, and computer interaction. This demonstrates that computer and tech literacy will continue to expand in education and future students will assist in furthering the advancement of these tools.

ORGANIZATION TOOLS

Within all of my interviews, interviewees mentioned organizational tools—such as Google Drive, Google Classroom, Dropbox, and Seesaw—as some of the most commonly used and easily accessible classroom technology tools. Students, teachers, and parents use these tools to collaborate, keep track of their work, turn in assignments, share readings and resources, and more. These are simple uses of technology in a classroom, but they make work and communication much easier across groups of people. A more extensive list of organizational tools/applications in the classroom may be viewed on the ISTE website.
AUGMENTED REALITIES

In Leveraging Digital Depth for Responsive Learning Environments: Future Prospects for Wearables, Augmented Reality, and Virtual Reality, Swanson et al. (2018) note:

Augmented reality’s strength lies in its ability to create dynamic visualizations that enhance learning environments... These visualizations can also aid understanding of complex concepts, systems, and ideas such as the human brain, the universe, or a chemical reaction (p. 12).

A few examples of emerging tools in the classroom using augmented reality (AR) include Blippar and ZapWorks as they provide the opportunity to easily create AR elements. Other popular AR experiences include tools such as Daqri’s Human Body and The Heart apps or iScience AR textbooks. There are many ways for AR tools to be created and used in the classroom to create interactive learning environments and bring education to life.

VIRTUAL REALITIES

Another way education is being brought to life is through virtual reality (VR). Seeing is Believing: Virtual Reality in Education (2016) announced, “Due to equipment costs and limited access to relevant programs, virtual reality in the commercial sense remains in its infancy.” As an emerging tool, VR continues to offer unique experiences for students. There are many VR technologies under development, one of the top on the list for education is ClassVR, an affordable VR headset that notes the following benefits of this technology in education: (1) Enriches literacy, (2) Places learning in context (within a virtual environment), (3) Improves retention through an engaging and immersive personal experience, (4) Support of specific learning needs, (5) Increased student engagement. Google Expedition has also been popular in schools, yet remains less affordable.

VR provides a platform for students to interact with others (regardless of geography), experience historical or out-of-this-world events, address challenges, and develop an emotional, engaging learning experience for students. Richter (2011) notes quality virtual worlds for
education developed by collaborative work environments such as Open Wonderland, Second Life (now known as Sansar), and OpenSim.

WEARABLES

Wearables have the potential to provide students and educators with a variety of data capture and feedback (such as physical well-being, cognitive and emotional processes, and more) in addition to interactive visual displays. Swanson et al. (2018), predict, “Expect to see wearables become more integrated with augmented reality and virtual reality experiences as interfaces that collect a wide variety of performance and user data continue to advance” (p. 9).

CONCLUDING EMERGING TECHNOLOGIES

Online videos and games, organization tools, augmented realities, virtual realities, and wearables all hold great potential for advancing the education of the next generation. Tools are continuing to advance and their use in the classroom is becoming more evident as they “increase student engagement, enhance the personalization of learning, increase understanding of others’ experiences and perspectives, help develop greater levels of self awareness, foster critical thinking, and increase student agency” (Swanson et al., 2018, p. 3). However, as Dr. Scharber mentioned during our interview, it’s not just about having access to the technology, it’s about how the technology is used. Richter (2011) expresses that these emerging technologies are “begging for experimentation and situated application.” This is where the technical communicator enters.

SECTION 3: IMPLICATIONS FOR TECHNICAL COMMUNICATION

In an evolving world, the role of the technical communicator is expected to change. But what implications are arising for technical communicators? How do our skills add value to curriculum, technology, and instruction? How will our role change as technology rises in education?
THE TRADITIONAL ROLE

Technical communicators have long been regarded as information mediators. The Society of Technical Communication describes the role of the technical communicator as follows: “They make information more usable and accessible to those who need that information, and in doing so, they advance the goals of the companies or organizations that employ them.” The Occupational Outlook Handbook on the Bureau of Labor Statistics website further expands on what technical communicators do:

Technical writers, also called technical communicators, prepare instruction manuals, how-to guides, journal articles, and other supporting documents to communicate complex and technical information more easily. They also develop, gather, and disseminate technical information through an organization’s communications channels.

Tom Johnson (2007), a professional technical writer and author of the famed blog site I’d Rather Be Writing, lists five core skills technical writers need:

1. Facility with technology
2. Ability to write clearly
3. Talent in showing ideas graphically
4. Patience in problem-solving/troubleshooting
5. Ability to interact with SMEs (Subject-Matter Experts)

In addition, William Hart-Davidson (2013, p. 51) identifies three key patterns of technical communicators:

Pattern 1: Technical communicators work as information designers.
Pattern 2: Technical communicators work as user advocates.
Pattern 3: Technical communicators work as stewards of writing activity in organizations.

The work of a technical communicator is broad. We maintain many skills, fill a variety of jobs, and must continually adapt to and learn new information and technology. Common skills many technical communicators possess include web design and development, instructional
design, technical illustration, visual communication, content creation, data visualization, document design, database management, writing clearly and concisely, and more. These skills provide key qualifications to fill gaps between the classroom and learning technology developers.

THE OVERLAP

The concept of technical communicators working with educational technology is not new. As the entire field has expanded to encompass more job titles, education has been on the radar: “The role of the technical communicator is moving to one involving a number of interdisciplinary areas, including grant writing, usability, educational technology, user interface design, multimedia design, and knowledge management” (Whiteside, 2003, p. 304, emphasis added). Focusing on Johnson’s (2007) five core skills listed above, technical communication fits into emerging technologies and classroom education quite well. I will use Johnson’s (2007) points as a heuristic to analyze the merge of technical communicators with emerging technologies and classroom education.

1. Facility with technology

Many technical communicators are trained in a variety of technological tools, such as Adobe Acrobat, Camtasia Studio, Adobe Captivate, Dreamweaver, Madcap Flare, Framemaker, Photoshop, Robohelp, DITA, Snagit, and Visio, as well as coding languages such as XML, HTML, CSS, and JavaScript. The variety of technology we are trained in allows our minds to easily adapt to other technologies. We have a natural curiosity about how things work and are eager to learn new technologies. Being a technologically-savvy people, technical communicators have the ability to quickly understand the surface functions as well as inner-workings of emerging technologies. In working with a variety of technologies, we also see the potential uses for these technologies, including classroom use. Within the classroom, our ability to understand and work with technology will assist with teaching others how to use the tools available to them to their maximum potential.
2. Ability to write clearly

Technical communicators are known for their ability to write clearly and concisely. This makes information understandable as well as easily accessible to the everyday person. This skill assists in the overlap of technical communicators, emerging technologies, and classroom education in two ways: (1) documentation and (2) training. As technical support and documentation is a central traditional role of technical communicators, we have the ability to compile content into usable and accessible forms. Our preparation of technical information is created with the audience in mind. Our work is easy to follow and understand, therefore we are prime candidates to provide training material for emerging classroom technologies. We can use our ability to write clearly to create documentation as well as teach new technologies to teachers, students, and parents.

3. Talent in showing ideas graphically

Written documentation is important, but effective communication often also involves visuals. As Johnson (2007) mentions, “People understand better when you can communicate your ideas visually.” Just as many emerging learning technologies encompass a visual aspect, technical content benefits users in the same way when a concept is portrayed graphically (or through other forms of visualization). Many technical communicators are also trained in visual communication, including graphic and document design, video or screencast work, data visualization, as well as CAD programs for 3D modelization. When developing documentation for either the tool itself or classroom training materials, the technical communicator may hold a vital position to create documentation visuals to assist in clarity.

4. Patience in problem-solving/troubleshooting

As technical communicators work with these emerging technologies, either in the company or in the classroom, a technical communicator must exhibit patience with both the technology and the people they work with. Since the
technical communicator knows the technology inside and out due to their involvement in the writing process, they will be able to problem-solve and troubleshoot with ease. Looking more directly at the problem-solving aspect, a technical communicator often must think creatively when designing documentation as well as deciding best methods to share information. This skill of creativity overlaps in a classroom training setting: if a user does not understand the training or part of the documentation, a technical communicator can quickly think creatively to come up with a new communication solution to best mitigate the need.

5. Ability to interact with SMEs (Subject-Matter Experts)

Technical communicators regularly partner with SMEs to act as translators: we take complex information and make it simple. Writing about something requires thorough understanding of whatever is being presented; holding a complete understanding of the technology, we can work between creators and users to communicate how to use as well as how to improve the product. As we overlap with classroom education and learning technologies, technical communicators act as the middle-man of information between developers and the classroom.

In addition to the above heuristic, I previously listed the three key patterns of technical communicators as identified by William Hart-Davidson (2013, p. 51):

Pattern 1: Technical communicators work as information designers.
Pattern 2: Technical communicators work as user advocates.
Pattern 3: Technical communicators work as stewards of writing activity in organizations

With a new role in mind, the overlap of the traditional role can redefine this list as follows:

*Pattern 1: Technical communicators work as educational information designers.*

As we create information design materials (from manuals to screencasts to PowerPoint presentations and more), we can design for education. Our
Pattern 2: Technical communicators work as student advocates.

In this rhetorical situation, our users are defined as students. With this new audience in mind, we work to generate simple and clear content through whatever means necessary for the student. We become involved in the process from start to finish: from design concepts, to documentation, to having contact with and participating in the student’s experience, to product redesign based on student’s feedback, we aid in developing the best tools for the next generation students.

Pattern 3: Technical communicators work as stewards of multimedia writing activity in schools and organizations.

With new technologies in front of us, our writing must be multimodal: we generate content for social media platforms, cloud-based applications, virtual and augmented spaces, and so much more. We have moved beyond the pen and paper; we create a variety of work specifically made for classroom use based on the technology they use and what the students and teachers need.

Overall, a technical communicator’s skills (in technological understanding, the ability to communicate well visually, orally, and in writing, quick problem-solving and troubleshooting instincts, as well as strength to mediate between groups of people) creates overlap between technical communication, emerging technologies, and classroom education by filling gaps in documentation, training, and misunderstandings between developers and the world of pedagogy.

A NEW ROLE

Based on the overlaps listed above, many implications for technical communicators are emerging. These identified new roles for technical communicators include but are not limited to:
- Educational tool/software documentation and creation
- Technology teachers (teaching teachers, students, and parents): jobs as a school’s training resource
- Institutional partnerships
- Technology translators/mediators
- SWAT team partnerships in schools

As mentioned in the Occupational Outlook Handbook on the Bureau of Labor Statistics website, the traditional role of technical communicators involves creating manuals and other documentation materials. These current skills can be implemented into education in two ways: (1) working in the industry to develop tool and software documents (i.e. manuals, training packets, instruction sets, how-to videos, etc.) for emerging learning technologies, and (2) developing similar informational materials for teachers and students to use in the classroom. Our knowledge of information design, thorough understanding of the product through our partnerships with the SME’s (creators of the tool/software), and knowledge of document creation processes (such as DITA and Adobe programs) qualifies us to take on this role. In addition, as technical communicators often have training in computer languages, we could also play a role in the tool/software creation itself.

In developing product documents and frequently interacting with SME’s, technical communicators often become experts of the subject themselves. With our gained expertise, as well as being people who are prone to having facility with technology, we have obtained qualification in becoming technology teachers. Having created the documentation for a certain learning technology, we know it inside and out. With this extensive knowledge, we can fill gaps left open by media specialists or a school’s IT team, who may only know bits and pieces of a product. As more and more technologies are incorporated in the classroom, there is a call for technical communicators to use this knowledge to aid in professional development for teachers:

1 Institutions such as or similar to: LTmedia.lab (http://lt.umn.edu), ETI (http://eti.umn.edu), CORD (http://www.cord.org/cord_proj_prof_dev.php), TIES (https://ties.k12.mn.us/what-we-do/professional-development/learning-and-technology-workshops), Pearson, McGraw-Hill, Scholastic, etc.

2 Students Working to Advance Technology (SWAT)
The digital depth enabled by wearables, augmented reality, and virtual reality can bring a new dimension to learning environments. Maximizing that potential will require thoughtful investment in educator professional development. Equitable access to high-quality training and professional development is critical for supporting teachers in their efforts to utilize these new technologies to enhance and expand their teaching. Educators will need exposure, time, and training in order to develop an understanding of how best to employ them. However, not all teachers need to become experts in these technologies; it may be increasingly useful to consider how specialized instructional technology roles might help guide their use within and across learning environments. Schools, school districts, and other places of learning without funds for professional development may not achieve the potential benefits for their students, creating or exacerbating gaps in access to high-quality learning experiences (Swanson et al., 2018, p. 39).

Working at the industry level with documentation and having an in-depth understanding of the tool, natural facility with technology, as well as people skills (in working with SME’s and other departments so frequently), technical communicators have the necessary skills to be sent to schools as a technology integration and training expert. We can assist with technological implementation as well as teach teachers, students, and parents on how to use the learning tools by providing step-by-step guides, manuals, training videos, screencasts, augmented lessons, and more. As we partner with leading learning technology institutions and school districts, we can be sent out as a school’s hands-on training resource.

This partnership between industry and school district opens up a new door for the technical communicator: the mediator.
During our interview on March 2, 2018, Fritz Vandover, Ph.D and Educational Technologies Consultant in LATIS at the University of Minnesota’s College of Liberal Arts, noted several issues between developers and the classroom that could be helped by adding a technical communicator into the picture. He commented that developers of learning technologies often don’t understand pedagogy: they’ve never taught, therefore they only develop from a technologist’s perspective, not an educator’s perspective. On top of that, many teachers (especially those who have taught for many years) don’t see the value in changing their system to incorporate new technologies and often view IT people as technicians, not someone who understands the educational side and values promoting the classroom.

Again, having facility with technology and assisting with the documentation of these tools, technical communicators understand many of these educational tools with great depth and ease. As we train in the classroom, we gain an understanding of pedagogy, teacher’s needs, and student’s needs. With these roles in place—working on the business side as well as in the schools—technical communicators act as the mediation communicator. We share knowledge about the tool to the classroom and then share feedback for improvements to the developers. With this, we assist in generating better learning technology tools by helping teachers feel known and heard for their needs. In response, developers can then better adapt the tool as they gain insight on pedagogy.

Finally, with technology rapidly changing and being integrated into schools, a scramble for training has occurred. Mr. Corey Soukup, a former teacher and current media specialist for a Minnesota school district (interviewed March 1, 2018), stated that they use the students themselves as a training resource for implementing technologies. They call this group of young trainers the SWAT team: Students Working to Advance Technology. Today’s students have never seen a world where they don’t have access to resources: technology is their life. Mr. Soukup commented that many teachers will ask a SWAT member to find an app or tool to help fill a need in their curriculum; the student will then do their research, bring it to the teacher, and then help teach the class. This method creates several positive results: (1) it allows students to help teachers learn how to use technology in the classroom, (2) it empowers students to lead,
(3) it lets students be part of the lesson rather than simply being told what to do, and (4) it allows for students to be at the forefront, generating insight as to what the students are interested in.

Technical communicators have great potential to partner with these SWAT teams. For one, we can learn to train teachers and other students together. Second, SWAT students can provide insight into their generation’s educational technology interests, which the technical communicator to bring back to the developers. Third, glitches in classroom technology can be more easily solved as we are involved in communicating with the student and teacher users in the technology’s intended context. Finally, we can work together to create a multi-generational system to build the best educational experience possible.

From documentation, to implementing and teaching, to working in-between multiple development contexts, and establishing partnerships, technical communication holds many implications within the field of educational technologies. Although we already maintain many of the required skills for these roles, the future holds other great possibilities for our field.

THE FUTURE

Accompanying the roles listed above, there is one more key implication that emerging learning technologies has enabled for the field of technical communication: next generation field expansion. The Occupational Outlook Handbook on the Bureau of Labor Statistics predicts:

Employment of technical writers is projected to grow 11 percent from 2016 to 2026, faster than the average for all occupations. Employment growth will be driven by the continuing expansion of scientific and technical products. An increase in Web-based product support should also increase demand for technical writers. Job opportunities, especially for applicants with technical skills, are expected to be good.

We have aided in the development of future technical writers through the development of pedagogical structure. Potts and Salvo (2018) state, “But the most important and far-reaching experiences we participate in almost every day of our professional lives is architecting our
students’ classroom experiences and the environments in which they learn to become professionals” (p. 6). Due to societal action and responding to the call for an education revolution, our students have been enabled with powerful tools to expand their minds. With these technologies at their fingertips, students, especially those involved with SWAT teams, have been empowered to be next-generation technical communicators.

From a young age, this next generation’s educational experience has prepared and developed the necessary skills to be future technical communicators. Generation Z is extremely tech-savvy; they can demonstrate their ideas in multiple ways; they have been trained to problem-solve and troubleshoot technology; they have worked with experts (like their teachers) to work through needs; they have helped teach their classmates; and they grew up in an era immersed in technology and have an understanding of where society will go next. The field of technical communication has a bright future due to the fact that so many intelligent students are being prepared with the necessary skills right now through daily life in the classroom.

CONCLUSION
Technology is advancing, the classroom is evolving, and the role of the technical communicator is shifting. The next generation has great potential for their educational experience. Technical communicators have the opportunity to play a role in developing the future of our society through these next generation students based on the fact that our current and expanding skills properly fill gaps to develop, document, partner, and train within the world of learning technologies. As the advancement of computers, game systems, augmented and virtual realities, wearable technology, and so much more continue to expand, overlap between emerging technologies, classroom education, and technical communication increases implications for our field. Nelson Mandela once said, “Education is the most powerful tool which you can use to change the world.” We—technical communicators, teachers, students, developers, designers, researchers, IT and media specialists, and other supporters—are changing the world.
At the end of the day, the first thought must remain on what the learners are trying to learn, not what technologies can be used. We must train teachers to be fluid with technology, enabling them to incorporate a variety of tools for their students to learn as they adapt to the continuous emergence of technology. However, teachers do not need to be experts of technology themselves; they need expertise in pedagogy with a passion to facilitate discovery through technology. We must not get caught up in the technology and forget the goal.

REFERENCES


EMAIL: INVITATION TO INTERVIEW — MASTER’S CAPSTONE PROJECT

Dear ______________,

My name is Sarah Canon and I am a graduate student at the University of Minnesota working to obtain my Master’s of Scientific and Technical Communication. This semester, I will be developing my capstone research project: Next Generation Education: Implications for Technical Communication. I am passionate about developing education for the next generation and the role learning technology and technical communicators will play in that process.

I write to ask if you would consider participating in my research? In developing my research methods, I came across your profile and determined that your field of study would bring essential perspective to my project. With that, would you take an hour of your time to interview with me?

Project Details:
This is a pedagogical study that investigates implications for technical communication in the field of education. The objective is to understand how the role of the technical communicator has and will change, add value to learning technologies, outline issues, and midiate gaps in terms of developing and implementing learning technologies. The study will document the shift in the educational paradigm due to technological advancements, look at expectations for the future of learning technologies, and examine methods of teaching and learning, with specific attention to the role of the technical communicator.

The Interview:
I would merely like to gain your perspective to the following questions:
- How has education shifted since the invention of the computer?
- What can we expect for the future of classroom technology?
- What are implications for technical communicators?

The interview will be a relaxed, semi-structured format and audio-recorded. I look forward to hearing your experience and insight to these main topics—your words will be of great benefit to my own project as well as the future of education.

Thank you!
Thank you for considering this request. If you agree to participate, I would be eager to schedule a time to talk with you. I may be reached by email at canon013@umn.edu or by phone at ###-####-#####. I sincerely hope to hear from you soon.

Best Regards,
Sarah Canon