ABSTRACT
For too long educational technologies have had a low impact on student achievement. The T3 Framework for Innovation solves this problem by synthesizing four decades of education research into highly reliable teaching and learning strategies which are clearly enhanced with digital tools. The strategies in the T3 Framework have an observed impact equivalent to four additional years of academic achievement in a single year. This paper will show how Cisco’s collaboration solutions can be leveraged to support high-impact strategies in the T3 Framework for Innovation.

Dr. Sonny Magana
Founder, Magana Education
Achieving Transcendent Learning

With Cisco Collaboration Solutions

By
Dr. Sonny Magana

“Transcendent uses of technology represent the top level of Magana’s system. The starting point for this level of use is student passion, and the ending point involves moving students from focusing solely on their own concerns to concerns about the greater good of their local and extended communities. Such a focus has the power to shift one’s consciousness outside current circumstances. Indeed, this is at the heart of the meaning of transcendence—shifting one’s perspective from idiosyncratic and myopic to communal and all inclusive. At this level, technology has an instrumental function. It cannot provide transcendent experiences, but it can help students create experiences that are transcendental to them with the guidance and support of the teacher. In effect, the teacher becomes as important to this process as the technology. It is at this level that the entire system changes.”

—Robert J. Marzano, CEO
Marzano Research

What is the Purpose of Education?

Any meaningful treatise on education today must begin with an articulation of the purpose of education in the modern context. One that will most likely meet with general agreement is this: The purpose of education is to ensure that students build abundant learning capacity and consolidate the requisite knowledge, skills, and aptitudes to successfully master current learning and future learning challenges. While no one can foretell what these problems will be, the future that today’s students will inherit will likely be even more globally connected through expanding digital networking systems, affording limitless opportunities for global communication, collaboration, and contribution. This paper will demonstrate how the global collaboration tools in Cisco’s WebexTeams, Webex Meetings, and Webex devices can help schools achieve the highest levels of the T3 Framework for Innovation, transcending the outdated expectations and limitations of traditional educational systems.
New Tools, Outdated Pedagogies

In order to meaningfully consider effective instructional methods for the purpose of education, we must recognize how modern classrooms are an integral part of a highly interdependent, global world. It is also important that we redefine classroom environments so students can learn anytime, anywhere, on any device. For example, students can take advantage of powerful global collaboration environments and tools like Cisco’s Webex Meetings, Webex Teams, and Webex Devices to engage in open-ended digital discussions with external experts, global learning projects stakeholders, and even create online tutorials or courses as platforms to scale the impact of their contributive learning experiences.

This new evidence base strongly suggests a significant acceleration in students’ learning can be realized when learners wield digital tools to enhance the ways in which they apply or transfer their newly acquired knowledge into relevant and authentic contexts.

Sadly, despite the tremendous growth in computer technology, Internet access, and training on the uses of digital tools in schools, the preponderance of evidence suggests that the effect of digital tools on student learning is downright dismal. In a recent meta-analysis, Hattie (2017) determined that the average impact of computers on student achievement is a surprisingly low effect size of ES=.34. By way of comparison, an effect size of ES=.40 represents the average amount of learning productivity gained over one academic year. Effect sizes above ES=.4 are clearly desirable, while effect sizes falling short of this average indicator are not. This effect size (ES=.34) is well below Hattie’s (2008) “Zone of Desired Effects.”
Disrupting the trajectory of low-impact technology use in education is a wicked problem that has mattered to me for four decades. A woeful implication of this wicked problem is that if it is not disrupted through innovation, then we can expect the average impact of new and emerging digital technologies on student achievement to be about $ES=.34$ for the next 50 years.

**New Tools, New Pedagogies**

There is cause for renewed optimism regarding the impact that educational technology tools have to improve student achievement. Compounding evidence now suggests that large to very large gains in student achievement are possible when digital tools are leveraged to enhance highly reliable instructional and learning strategies (Haystead & Marzano, 2009; 2010; Haystead & Magana, 2013; Magana, 2016; Magana, 2017). This new evidence base strongly suggests a significant acceleration in students’ learning can be realized when learners wield digital tools to enhance the ways in which they apply or transfer their newly acquired knowledge into relevant and authentic contexts.

**The T3 Framework for Innovation in Education**

The T3 Framework for Innovation is a new model for enhancing high reliability pedagogy with technology. The T3 Framework was synthesized directly from this emerging body of research to intentionally make these findings actionable in today’s classroom (see Figure 1.0). The T3 Framework organizes the impact of educational technology into three hierarchal domains: T1) Translational, T2) Transformational, and T3) Transcendent. Each domain is further organized into elements, and strategies which are concrete, actionable, observable, and measurable.

The T3 Framework elucidates critical shifts on how classroom teachers can better use their existing educational technologies to specifically enhance making students’ thinking and
learning visible to their teachers, themselves, and their classmates. A brief overview of each domain in the T3 Framework and how the T2 and T3 domains can be supported by Cisco Webex tools are warranted.

Source: Disruptive Classroom Technologies (Magana, 2017).

**T1) Translational Technology Use**

The T1) Translational Technology domain reflects the most common ways that digital tools are used in schools. Translating tasks from analog to digital adds value in increasing efficiency, accuracy, and time savings. The two elements in this domain are T1.1) Automation, where administrative teaching and learning tasks are automated, and T1.2) Consumption, where teachers and students access and consume digital knowledge and information content from online sources or other electronic media. T1) Translational technology use is not trivial, but neither should it be considered an ultimate stopping point; however, far too many educational systems limit their uses of technology to this entry-level domain. This, in no small way, may contribute to the low impact digital tools have had on student achievement.
T2) Transformational Technology Use

Transformational technology use reflects the intentional application of digital technologies to unleash students’ learning expertise, in ways not possible without technology, to achieve ever higher levels of knowledge and mastery (Magana, 2017, p. 39). The two elements of the transformational stage of technology use are: T2.1) Production, and, T2.2) Contribution. In the production stage, students leverage technologies to produce mastery goals to help them develop self-regulation, tracking, and monitoring strategies, and produce digital representations of their knowledge. In the contribution stage, students use digital tools to design, create, share, and scale digital knowledge products with the purpose of teaching others what they know.

When students harness digital technologies to improve their world, they are effectively transcending the limitations of the industrialized education model.

Students can leverage the powerful production and contribution tools in Webex Meetings and WebEx Teams in a way that is illustrative of the T2) Transformational Domain. For example, students can wield the digital whiteboard tool embedded in WebEx Meetings to annotate how they arrive at a solution to an algebra problem, then use the screen recording tools to record themselves talking through each step in the process—in effect, making their thinking not just visible, but fully explicit to their teachers, their peers, and themselves. Moreover, students could further use these authentic digital recordings in WebEx Teams as a platform to archive, curate, and share these recordings as student-produced learning tutorials to help their peers learn from their thinking.

The elements and strategies in the T2) Transformational Technology were observed to have an effect size of ES=1.6, which represents an exceedingly large impact on student learning.
To put this into perspective, an effect size of 1.6 is equivalent to an additional three or four years of academic achievement in a single school year. This is equivalent to a tripling or quadrupling of student learning productivity: the quantity of academic content which students learn during an academic year. Another way of looking at an effect size of ES=1.6 is tantamount to an acceleration in student learning which reduces the amount of time it takes for students to master current learning content. One can expect students to become far more current learning ready when the strategies in the T2) Transformational domain are implemented with reasonable fidelity. While this is necessary, it only addresses part of education’s purpose; we must also ensure that students consolidate the requisite knowledge, skills, and habits for future learning readiness.

**T3) Transcendent Technology Use**

It’s important for students to practice solving well-defined, “neatly packaged” problems with a single clear solution. It’s also important for students to practice using known algorithms, or heuristics, to solve those problems. The not-so-clear but present danger here is that if we only allow students to tackle clearly identified problems with equally clear solutions, they may erroneously think all problems they will encounter in life are readily identifiable, well-structured, and easily solvable with simple heuristics, such as memorization and knowledge retrieval. The implication to this problem is that students may become habituated to a simple binary “right answer/wrong answer” approach to problem-solving. However, life doesn’t exactly work that way. Life problems are often messy. They require critical and creative thinking, communication, collaboration, deep consideration, and collective contribution.

In the digital era it is no longer sufficient to ask students what they want to be when they grow up, as the jobs to which they will aspire may likely not yet exist. A far more important
question to pose to today’s learners is this: “What wicked problem matters to you, and what are you going to do about it?” Wicked problems are tantalizing because they are ill-structured, highly complex, intractable, multi-faceted, and as yet unresolved. Transcendent technology use reflects students’ agile, adaptive, and contributive application of digital tools to scaffold the process of solving wicked problems that matter to them. When students harness digital technologies to improve their world, they are effectively transcending the limitations of the industrialized education model.

Transcendent technology use represents an entirely new domain of strategies that are only possible when students mindfully wield digital technologies in ways that foster their passion for improving their world. Transcendent technology use begins with student passion and concludes with students using digital tools to engage in designing original lines of inquiry, transferring newly acquired and consolidated knowledge, and applying social entrepreneurship strategies to solve wicked problems that matter to them. The two elements of transcendent technology use are T3.1) Inquiry Design, and, T3.2) Social Entrepreneurship.

**T3.1) Inquiry Design**

The strategies in the T3.1) Inquiry Design element scaffold students’ uses of digital tools to first identify, then investigate, hypothesize, and design resolutions to wicked problems that matter to them. This is a multi-step process of authentic inquiry that is best done in collaboration with peers and experts, within and beyond their classroom walls.

So, where can students find a compendium of wicked problems that matter? In 2015, visionary world leaders agreed to 17 goals for a better world by 2030. These Sustainable Development Goals (SDGs) represent 17 domains of wicked problems that matter to students, and serve as a clarion call to student leadership for action to end poverty, fight inequality, and
stop global climate change (see Figure 2.0). For example, students engaged in a collaborative
global inquiry on the quality of drinking water in their communities can connect with one
another, experts in the field, and other researchers easily and efficiently using WebEx Teams.

![Global Goals for Sustainable Development](www.globalgoals.org)

Students can also readily use Cisco’s Webex Meetings’ and Webex Teams’ recordable
video conferencing, real-time document sharing, and multimedia production tools to enhance
each strategy in T3.1) Inquiry design element through continuous collaboration with global
inquiry partners. Using these tools in a contributive manner, students stretch the range of their
collaboration well beyond the traditional classroom walls, engaging teams of global student
partners, faculty, and parents, and extending their learning networks to more effectively identify
resolutions to wicked problems that matter to them. These collaborations are persistent: students
can join others in teams or groups before, during, and after traditional class sessions, sharing
documents and insights, and they can do this virtually in writing within the team space, over
voice, or over video.

**T3.2) Social Entrepreneurship**

The strategies in the T3.2) Social Entrepreneurship element guide students to wield new
and emerging software coding environments and communications platforms to iteratively
generate and scale more robust digital solutions to the wicked problems that matter to them. Doing this at least once a week—for example, on “Wicked Problem Fridays”—will afford students ample opportunities to explore, interpret, discuss, and critically analyze knowledge and information that is important to them.

For example, students can use Cisco's Webex Team app on any device to collaboratively design an actual cloud-based or digital solution—such as an app for testing and monitoring drinking water quality—with global partners distributed across the world. Cisco’s Webex Meeting and Webex Teams also provide students a suite of powerful communication, collaboration, and contribution tools that enable classrooms to build collective impact. Collective impact occurs when groups of students act upon their passion for improving the world locally, in tandem with their global partners.

**It is at the T3) Transcendent level of Magana’s T3 Framework that the entire education system changes. (Marzano, 2017)**

Engaging in this type of focused global collaboration will help today’s students develop the skills to become future-ready learners who understand that learning is not an end unto itself, but a means for applying their knowledge, skills, and creative innovation to improve their world, one wicked problem at a time. Perhaps more importantly, working with teams of global classmates to achieve the SDGs, students will realize that their collective agency—the belief in a group’s ability to positively change the world—increases exponentially when they are connected through global networks to achieve common goals. Webex video conferencing devices and environments offer today’s classrooms a multitude of opportunities to build collective impact and agency by connecting with global networks of students, teachers, inquirers, and experts, to transcend the limitations of the industrial model of education.
Conclusion

As Dr. Robert J. Marzano kindly noted in his foreword of my book, it is at the T3) Transcendent level that the entire education system changes. This is the system change that is needed in order to achieve the purpose of education in the digital age. Modern learning systems can no longer rely on evidence-free opinions to best understand how technologies will accelerate student achievement. We’ve tried that for decades, and what we have to show for it are classrooms that are digitally rich, but innovatively poor. While no one can foretell the future, I will hazard a bold forecast: Using the guidance provided by the T3 Framework, modern education systems can leverage Cisco’s powerful global collaboration and contribution tools to build, rather than rely upon, pedagogies of the past to generate collective efficacy. Doing so will not only disrupt the historic pattern of low technology use in education, but will serve to realize the purpose of education in the digital age.

References


ActivClassroom. Centennial, CO: Marzano Research.

