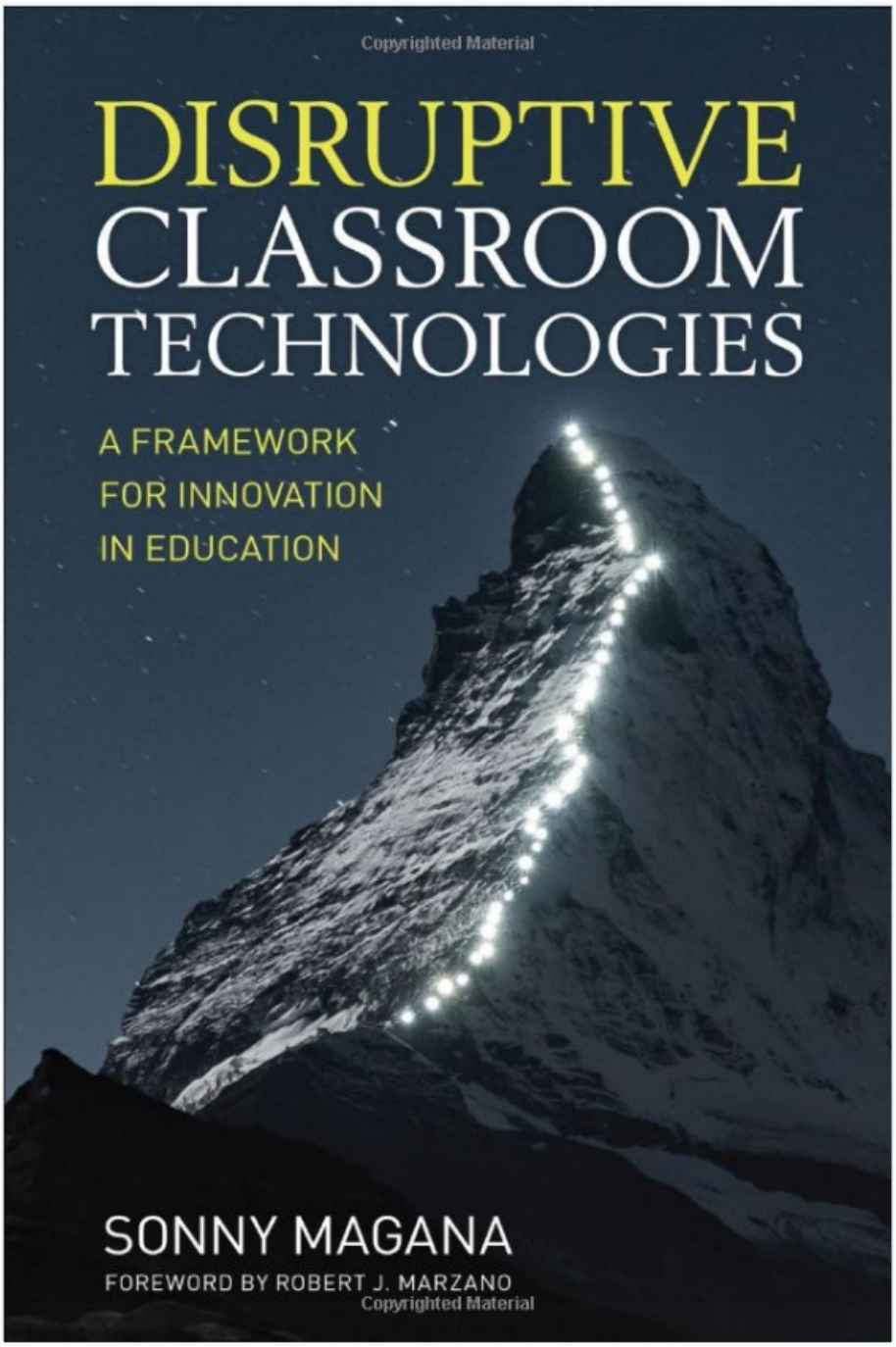
EURASIA Journal of Mathematics, Science and Technology Education, 2018, 14(5), 2039-2041
ISSN:1305-8223 (online) 1305-8215 (print)
Book Review https://doi.org/10.29333/ejmste/85871

Disruptive Classroom Technologies

Bing Wang [1*]

[1] Central South University, Changsha, CHINA

Received 12 January 2018 ▪ Revised 1 February 2018 ▪ Accepted 18 February 2018



✉ csuwangbing@126.com **(*Correspondence)**

The modern world is witnessing rapid advancement in digital technology which has already brought about drastic changes in almost every aspect of life. Educators find it a must to embrace and come up with better learning tools and processes to prepare the learners for professional and social success in the years to come. For that to happen, the education system worldwide has channeled enormous resources to digitize classrooms. Besides purchasing new equipment, learning institutions at all levels have vigorously undertaken to train tutors to use technology. However, the result is minimal in spite of the concerted effort. The constant media propaganda on the alleged impact of digital learning and teaching does not yield adding-up effect. On the contrary, the impact technology has had overall seems to spiral downwards. John Hattie reviewed about one hundred and sixty meta-analyses of nearly 10,000 studies and found the average impact of technology was merely 0.34 (Hattie, 2008). This measurement shows that technology's effect size in teaching and learning falls short of the expected average of 0.4. So here is the question to ponder: why don't more technologies bring better learning?

The answer is readily available in the book *Disruptive Classroom Technologies: A Framework for Innovation in Education* by Dr. Sonny Magana. He holds that the reason lies in the manner technology is applied in teaching and learning. The author carried comprehensive research on the problems of advancing technology and innovation in the field of education. Existing classroom applications are mostly low-valued translational use of technology. To see promising results, the current practice needs to be overhauled. The book offers a solution that would best solve technology integration with education – the T3 framework. What's more, it provides vivid examples of how to use technology in the T3 framework, how to stimulate the teacher and learner to deepen their use of technology to higher levels for the purpose of knowledge gain (Magana, 2017). Also, the self-assessment guides as well as prompts are available to enable progress tracking towards achievement of the goals. The book is aimed to enhance realizing target learning and teaching goals using the T3 framework for change in education as a lens of scrutinizing schools as well as the schooling system.

At present, two dominant approaches are used guiding technology use in educational settings, and they are TPACK (Technology, Pedagogical and Content Knowledge) and SAMR (Substitution, Augmentation, Modification, and Redefinition) (Hilton, 2016). TPACK came out in the late 1990s, aiming to increase the significance of technological knowledge as equal to pedagogical and content knowledge. Nonetheless, it doesn't explain how to achieve technical change, which is a challenge. It's fair to say TPACK has an objective but lacks a pathway. Likewise, SAMR puts forward goals but no way to achieve them. It sets four distinct levels of interaction between tasks and tools (Magana, 2017). Educators spend a great amount of time analyzing the approaches in teaching and learning context. However, both models are sluggish and fail to contribute to the learning process significantly.

Among the many variables affecting student achievement, the capacity to evolve and frequently handle change in the learning process is of crucial importance. Classroom instruction quality is directly related to various strategies used. A sequence that basically determines and assesses the learning experience is in place. When students initially interact with new content, they have to familiarize with the knowledge. The learning stage is known as the surface learning where students first get exposed to superficial tests and vocabulary describing their new content (Magana, 2017). Then, students will practice and expand their knowledge comprehension. This is the stage where a connection is established between prior and present skills. Afterward, the learner generates inferences and deductions in acquiring experiences. This phase is the most cognitive and challenging but also the most rewarding.

The book *Disruptive Classroom Technologies: A Framework for Innovation in Education* is structured in a way that promotes actionable technology usage in schools through three different stages. These include T1: Translational, T2: Transformational, and T3: Transcendent (Magana, 2017). The implementation mode is incremental. Together they provide a pathway that promotes educational use of technology in unleashing learners' boundless potential and greatest capabilities.

As mentioned above, the average effects of technology on learning have consistently been minimal. This situation is largely caused by the only or excessive translational use of technological tools which often focuses on the initial stage of learning. According to Magana (2017), currently technological devices are primarily adopted to automate non-instructional duties that teachers perform on a frequent basis, like reporting, grading, sending emails, attendance taking, class planning and documents creating and filing. These tasks do not correlate to teaching although they are fundamental to school-running. Some of the modified tasks include consuming information from online content and resources, and testing. But they are merely translating the content from analog to digital form (Magana, 2017). It makes sense in terms of enhancing accuracy, saving time and adding efficiency yet hardly adds value in learning. This is basically the initial phase of learning, and in most cases, learning institutions complete their technology use there, hence eliminating vital steps in the most rewarding stage — transformational and transcendent use of technology.

Transformational technology use stands in the second phase in the T3 framework. It entails changes and enacting changes. The phase involves a realm that tries to foster a mastery mindset on the learners' part through setting customized mastery goals and then carefully monitoring the impact of their effort and tracking progress towards the learning objectives (Magana, 2017). In addition, learners are given various opportunities along the way

to make use of digital tools to show what they know and how much they can achieve. In the process of sharing, it makes their thinking explicit as they can also contribute to others' learning. Creating learner tutorials, for example, is a good illustration of implementing the phase. These tutorials form an integral part because they empower students to actively explore new concepts. Besides, sharing knowledge and problems with their peers enables building a favorable learning environment.

The last stage in the T3 framework is transcendent use of technology. That is to "go beyond" the classroom and into real life. Nowadays, students usually have a very vague idea of what they will become and what they can do in the future. What seems essential is the problem they see around them and how they figure out a way to solve it. In light of that, in addition to enable maximum growth in the learners' cognitive capabilities, transcendent technology use pushes the limits of previous expectations and past experiences for education. This phase uses some strategies including investigating and identifying problems in real life, hypothesizing plans and goals, beta testing and iteratively coming up with robust solutions to problems that matter to learners (Magana, 2017). It bridges the gap between the school and real life, integrating digital and cloud-based production technologies. The concept of cultivating social entrepreneurship is formally incorporated in educational use of technology.

The hierarchy of the above-listed three stages helps all the people involved in education reflect on the status quo of their technology use: Which stage is it in? What else can be done to make better use of technology? Has the technology use been integrated with education to achieve transformation and transcendence in learner knowledge gain? The simple revelation of these better, higher stages promotes self-assessment not only on the teachers' and learners' part, but also on the part of education administration. Pedagogy precedes technology. The teaching world is seeing an over-abundance of technological tools. Instead of hastily installing the most recent online platforms or being equipped with entirely different digital gadgets because they seem trendy, the T3 framework helps both the teachers and students get emancipated from myriad digital tools. Instead, they will focus on carving out a viable plan in specific teaching context and find the proper solution with the technological tools that serve the learning purpose. By doing so technologies are more likely to bring out "disruptive" rather than "distractive" outcomes.

Despite its remarkable enlightenment, the T3 framework has to trickle down and change people's mindset gradually. Appraisal of students' performance in transformation and transcendence stages is less direct and simple compared to conventional tests. It also poses a challenge for teachers to break down knowledge blocks and guide learners to complete certain tasks in one semester. Thus, the conventional learning practice will continue in the foreseeable future. Teachers would keep stressing to the students the significance of knowledge and students would likely memorize it with the aim of reporting correctly. The dominant "tell and practice" model will proceed. In terms of measuring learning and teaching effectiveness, tests that intend to check skills but in reality measure the precise knowledge recitation would continue. Therefore, it will take some time before the T3 concept sinks in, takes hold and starts a fundamental innovation in education.

To conclude, in an era when new developments keep shaping the learning surroundings, there is almost the prediction that machines would play an essential role. Technological advancements would be on another level, all aiming to bring about the best in the student (Magana, 2017). New approaches would result on how to deal with challenges among other innovative ways. The methods would cultivate and make sure learners become active consumers of knowledge to build their innate desires for interdependent creativity. It should be noted that while human beings have to embrace ever-increasing technological tools in education, technology is basically value-neutral. How it is used determines whether it is value-positive or not. Its educational benefits can only be achieved when implemented and integrated properly. Failing to recognize that would be detrimental as the technology would be of no significance.

ACKNOWLEDGEMENT

This research is jointly funded by Hunan Foundation for Philosophy and Social Science (16YBX053) and Central South University's Open Pilot Courses Project (160050002).

REFERENCES

Hattie, J. (2008). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. London: Routledge.

Hilton, J. T. (2016). A case study of the application of SAMR and TPACK for reflection on technology integration into two social studies classrooms. *The Social Studies*, *107*(2), 68-73.

Magana, S. (2017). *Disruptive classroom technologies: A framework for innovation in education*. Thousand Oaks, CA: Corwin.