

TECHNOLOGY RICH LESSONS: WHAT MIGHT THEY LOOK LIKE?

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Mention the phrase “technology rich lesson” to technologists, administrators, and teachers and the resulting discussion will contain diverse ideas about the use of technology in daily instruction. Unfortunately, the proliferation of this phrase in educational journals, research reports, and conference proceedings often leads educational technologists to erroneously assume that everyone has similar ideas of what integrating technology into daily teaching should look like. However, this is not the case. We know from research (Rogers, 1995) that the diffusion of any new innovation is a slow process. Since integrating technology into the classroom is a process and teachers will always be at different stages in the diffusion process, the technology rich learning environments created by the teachers will always vary. However, I believe there are commonalities among these different technology rich lessons and learning environments. When I speak with people about technology rich lessons and how I began to effectively function as a change agent when working with teachers in the creation of these lessons, I share the story of my evolution of understanding on integrating technology rich learning environments into my teaching. This allows me to recount some of the events that shaped my insight about technology rich lessons and to show similar elements evident in these learning environments.

After talking with numerous educational technologists, I find my story is similar to others. The way I function as a change agent now is dramatically different from the approach I took when I first started working with teachers and technology. My beginning experience in the integration of technology into the curricula was as the computer science teacher in a large public high school with an extremely innovative principal. In the early 1990s, this principal saw computers as a way to enhance student learning and provide additional means for our students to become life-long learners. The principal acted as the primary change agent for our school. His leadership was strong yet supportive, and a majority of teachers responded in a positive fashion. During the early 1990s, the use of Power Point, Hyper Card, and email in the classroom was rather innovative for teachers and students; yet most of our teachers did not know how to operate computers much less use them in instruction. Therefore, the principal and I devised a plan to teach the faculty how to use these computer applications in their teaching. Our plan was to start with a cohort of teachers and train them first. Cohort members would attend a semester long 3 hour weekly class where I would teach them to use the various computer applications. In return for being a member of the cohort, teachers who completed the training would receive a computer and a projection panel for their classroom. (During 1990-91 school year, it was a rarity for a teacher at our school to have a computer in their classroom.) The following semester another cohort of teachers would begin their computer adventure and eventually, the entire faculty would be trained.

The first semester of training went well. I taught the teachers how to word process, use spreadsheets, create databases, perform mail merges, make Power Point presentations, and create Hyper Card stacks. The teachers were extremely positive and created simple yet dynamic lessons that included graphics, sounds and simple animations. Students clamored to get into classes where teachers used technology. The principal and I were pleased and congratulated ourselves on our great success. Unfortunately neither of us realized we were working with the early adopters. Our task was going to quickly become more difficult. My experience with the second and third group of teachers caused me to consider that I was approaching the integration of technology into daily teaching from an extremely narrow point of view. I realized it was impossible to have “cookie cutter” lessons that would work for all subject areas. In addition, it was unrealistic for me to assume that everyone could and would easily alter their style of teaching. I was shortsighted in believing that everyone wanted this innovation in their classroom. I recognized that I needed more assistance and a better understanding of how to assist teachers, but I was unequipped with the knowledge to progress. It was at this point that I returned to night school and began my graduate studies in educational technology.

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Much to my surprise, I discovered that what I experienced first hand with my peers at the high school is mirrored in research. Data from over a decade of research from the Apple Classroom of Tomorrow (ACOT) research project indicates that teachers progress through five stages (entry, adoption, adaptation, appropriation, and invention) in their pursuit of integrating technology into their teaching (Sandholtz, Ringstaff, & Dwyer, 1997). While other stages have been identified (Becker, 1994; Berson, 1996), it is undisputable that it takes time for teachers to become effective technology users in the classroom. Results from numerous studies (David, 1995; Jones, 1994; Roblyer, 1997) on the successful and unsuccessful integration of technology allow us to see how various levels of technology rich lessons emerge. But what are some common characteristics seen in the various stages of teacher produced technology lessons? Again, research provides information in this area and the findings are reflected in the classroom.

Dr. David Jonassen provides nine attributes of meaningful and engaging learning environments. The attributes are: active, intentional, reflective, conversational, complex, contextual, collaborative, constructive, and responsible. These attributes certainly do not require the use of technology. However, I noticed as I continued working with teachers that as they created their technology-rich lessons these attributes consistently appeared. There was a common thread that ran through the various technology rich lessons that I saw teachers create! When I started to ask the teachers why they created their lessons in the manner they did, the response always dealt with wanting students to have a deeper understanding of the concept and how it related to various disciplines. Many times the teachers created lessons that allowed students to perform the same strategy (ie. researching information) but in a better or more efficient manner. Other lessons allowed students to perform tasks that they previously were not able to do at all. I repeatedly heard teachers express the desire for their students to function at a higher level and make connections with other academic disciplines and real-world applications. The teachers seldom used Jonassen's exact attributes of a meaningful and engaging learning environment, but the same premise was there. My peers and I found that not only were we thinking more globally about our lessons, but our students were starting to consider concepts from multiple perspectives! The technology was enabling us to function and learn at a higher level. More recently, many students and teachers are beginning to see the Internet as a totally new learning environment.

I was also able to see evidence of Rogers' (1995) innovation diffusion theory when working with teachers. Rogers' grouped people into five adopter groups in order to discuss and compare them. This continuum included innovators, early adopters, early majority, late majority, and laggards. By determining where teachers were on the diffusion continuum, I could better understand and relate to them when assisting in the infusion of technology into their daily teaching. I constantly reminded myself that infusing technology into daily teaching requires a shift in teaching style and is often a time-consuming and uncomfortable process for many teachers. Using the knowledge from research and my own experiences, I restructured how I work with teachers on creating technology rich learning environments for their students. In the past, I did not effectively communicate with my peers that technology rich lessons evolve with the teacher and student. Now I share the idea that the diffusion of an innovation is a process. This results in products being different but having similar elements. Creation and implementation of technology rich learning environments expands and improves just as teaching should constantly evolve. Once these general themes have been shared and discussed, the next hurdle is having each teacher determine what a technology rich lesson is for him or her.

Once teachers are ready to start creating technology rich learning environments for their students, I remind them that the use of technology is not an "all or nothing" commitment. This allows teachers to experience trialability which is one of Rogers' characteristics of successful innovation. Every lesson does not have to be rich in the use of technology. This provides a great deal of encouragement to teachers. I use several strategies simultaneously with teachers as we begin to create technology rich learning environments. First, I ask teachers to bring in a lesson that has not been very successful in their teaching. We all have a lesson that is frequently flat when we teach it. I encourage teachers to start with a poor lesson and leave their great lessons alone for now. We take the flat lesson and let the work begin! We brainstorm different ways to approach the lesson, the technology available (bulletin boards, application programs, using the

Internet and web) and the technology's impact on student learning. We also explore the web to see if another teacher has already created a lesson teaching the same or similar objectives but with a different emphasis. The brainstorming and exploration of various web sites allows the teacher to begin thinking about creating a richer technology lesson. These beginning technology lessons are not always "rich" in the use of technology. Most of the time, the technology is being used as a substitute for a more traditional method of teaching. However, the teachers become excited and develop multiple perspectives of their lessons which can lead to deeper understanding by the students. We are successful when the teacher starts allowing technology to assist in answering new questions for students instead of having technology answer the same questions. One teacher remarked that she realized she was asking technology to be the answer to old questions instead of finding new questions where technology could be part of the answer!

Another strategy I use to assist teachers in the integration of technology is to bring sample lesson plans at various stages of "richness". I show teachers that are anxious and unsure of creating and using technology rich learning environments examples that are close to what they might currently do in class. We discuss how this lesson might provide students with a deeper understanding of the topic or better tools to accomplish the required task. Simply providing a number of ideas sparks the teachers into action. As the group of teachers continues to progress, I provide lessons or lesson ideas that model a richer environment for the students. It is important to remember this process takes time. Using technology rich learning environments is not something that can be accomplished during the course of one or two workshops. It is a process that takes commitment from the administrator, teachers, and educational technologists.

In conclusion, my work today with teachers on the integration of technology into daily teaching is vastly different than when I worked with my peers at our high school. I emphasize to the teachers that the look of technology rich lessons will always depend upon the teachers' stage of adoption with respect to integrating technology into teaching. The diverse lessons that are created do have commonalities which lead to a greater emphasis on higher order thinking skills, cross-curricular activities, cooperative learning, researching and evaluation of material. In my opinion, teachers are moving toward creating more technology rich lessons which in turn creates richer learning environments for students. Still, educational technologists must understand where teachers are on the diffusion continuum and advance with them as a team. Examples of various technology rich lessons created by the faculty and students at the School of Teaching and Learning at the University of Florida can be found at the Teacher Resource Support Center on the Educational Technology web site. The URL is:
<http://www.coe.ufl.edu/Courses/EdTech/Support/Teacher/index.html>.

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