Technology and the Prepared Environment for the Third-Plane Child

by Cynthia Castiglione

Cynthia Castiglione presents Near North Montessori School's (Chicago) adolescent community's approach to technology. Her framework begins with the needs of the adolescent for social independence, social acceptance, and social justice. Using that template, she defines seven keys or characteristics that make up the technological environment: adaptability, social, real, independent, structure, order, safety, beauty, and the role of the guide. Montessori's writings are interspersed with each area to support her orientation.

> It is necessary that the human personality should be prepared for the unforseen, not only for the conditions that can be anticipated by prudence and foresight. Nor should it be strictly conditioned by one rigid specialization, but should develop at the same time the power of adapting itself quickly and easily. In this fierce battle of civil life a man must have a strong character and quick wits as well as courage. He must be strengthened in his principles by moral training and he must also have practical ability in order to face the difficulties of life. (*From Childhood to Adolescence* 61)

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- How are you adaptable?
- How do you allow your classroom, your school, your prepared environment to adapt to the needs of your adolescents?
- What do your students need to learn about technology in order to use it morally?

These are the questions you should ask yourself as you begin to think about integrating technology into your classroom. In this resource I hope to provide you with my philosophy behind the methodology of technology in my classroom and our school in an effort to share how my thinking has evolved over the last thirteen years of teaching.

Near North Montessori's Prepared Environment

It's important to know a little bit more about my own prepared environment and its guiding principles so that you can understand where my observations come from. I have been a teacher at Near North Montessori since 2009. Without a doubt, the biggest, loudest, and hardest to ignore part of our prepared environment is our city, Chicago. Our school and our urban farm, that we lovingly call our "Farmessori," is just northwest of downtown in a community known as West Town. West Town is a combination of old and new Chicago – where rooted residents fight for both affordable housing and equity amidst would be gentrifiers. It is the perfect textbook for our adolescents. The city is filled with all the beauty, complications, and contradictions of the real world. As we know for the adolescent, the prepared environment has to include many things above and beyond the Montessori materials of the primary and the elementary level. We have to go out of the building, exploring the city and find ways to bring the outside in. Technology allows us a chance to do this.

> I make this differentiation about normalization because it is easy to make space in the prepared environment for technology if the students themselves have been in the prepared environments appropriate to their age before adolescence. They already know what "work" looks like.

Near North Montessori's role in the community has evolved as we have grown over the last fifty years. We have a diverse student population of more than 570 students–from four months to fourteen years old. We have a range of 79 to 90 seventh and eighth grade students in any given year, divided among three homerooms averaging with a class size of about twenty-eight. I mention this because the larger your population, the more likely it is that you are struggling to find control in the chaos of technology.

Technology's Role in Lower and Upper Elementary

At Near North we do not think that it is developmentally appropriate for the first-plane child (0-6) to be using technology as part of the prepared environment. The young child learns best when all senses are engaged in learning, and when experiences are both real and concrete in nature. Technology does not offer both of those to the first-plane child.

In the second plane (ages 6-12), we start to consider it as a tool for learning and as an extension of classroom resources. This is where the role of the outside specialist can be vital in supporting the work in room.

We have the most amazing educational technology director at our school, Janeen Cohen, who, though not trained, has been in Montessori classrooms for more than thirty years as a guide and specialist. She works with all the students but is primarily responsible for the introduction of technology in the 6-9 and 9-12 populations as an outside specialist. She plants the seeds in the children when they are younger about the need to respect technology, and that technology is work. But most importantly, she respects the needs and tendencies of the students to find meaning in their work. She sees herself as much as an explorer of all that technology has to offer as the students themselves. Janeen's enthusiasm for and love of learning motivates the students by the time they walk into junior high and is crucial in helping to prepare them for the challenge and the adventure ahead.

From a technological standpoint, members of our 12-14 student population have a number of things in common from the moment they walk through my classroom door:

- All have a cell phone, or access to one.
- All have internet access and/or personal computer.
- All have basic understanding of how to use the Internet as a research tool.
- 90-95% have been at this school since they were three, if not two. They are normalized (if not, we are in big trouble!)

I make this differentiation about normalization because it is easy to make space in the prepared environment for technology if the students themselves have been in the prepared environments appropriate to their age before adolescence. They already know what "work" looks like. That knowledge of what real, meaningful work looks like is important when we want them to translate the learned knowledge into a new application.

Courtesy of Hugh Kdayssi

Would Maria Montessori Embrace Technology in the Adolescent Classroom?

> For in our times science has created a new world in which the whole of humanity is joined together by a universal scientific culture. Thus, children should learn to use machines habitually as part of their education. (*From Childhood to Adolescence* 78)

Yes, I believe she would. She would see it as a tool necessary for preparing them for the real world. Machines, as she talks about them, can be viewed synonymously with today's technology. Lucky for me Merriam Webster agrees:

- the use of science in industry, engineering, etc., to invent useful things or to solve problems
- a machine, piece of equipment, method, etc., that is created by technology

She would be asking us though to consider how the use of technology fits the needs of our adolescents and prepares them for their social responsibility.

How Does the Use of Technology Fit the Needs of My Adolescents?

> When he enters the workday world, man must be aware first and foremost of his social responsibility. If he is not, we will have not only men without heads and without hands, but also men who are selfish, who have no consciences, who are irresponsible members of society. In a society such as ours, full of complications and dangers, it is an enormous responsibility. It is therefore necessary to prepare men to be aware of it… (*From Childhood to Adolescence* 78)

Montessori called the third plane "a school of experience in the elements of social life." Therefore we should be actively using our prepared environments for the real work they will face in life. My colleagues Meg Broz and Jamee Warrenfeltz recently presented a framework that I think beautifully ties together the two needs: those of the adolescent with those of the prepared environment. I find this way of thinking helpful and have applied similar thoughts to the prepared technological environment. They broke down the

needs of the adolescent through the needs of the third-plane child by focusing on the adolescents' social needs:

- Social Independence
- Social Acceptance
- Social Justice

These are the key needs of the adolescents in the prepared environment. So why should the prepared technological environment be any different? I do not think they are.

We should be focused on creating a *technological* environment in which the adolescent can discover the work. In this environment, the guide functions as a spark to discover the work. This is critically important when we look at how Maria Montessori defines "work" for the adolescent.

> There is need to realize the value of work in all its forms, whether manual or intellectual, to have a sympathetic understanding of all forms of activity. Education should therefore include the two forms of work, manual and intellectual, for the same person, and thus make it understood by practical experience that these two kinds complete each other and are equally essential to a civilized existence. (*From Childhood to Adolescence* 65)

Dr. Montessori, if she was alive today, would probably say something very similar with regard to technology as another educational tool within the prepared environment . What is fascinating and should surprise no one is that modern educational theory is finally catching up with her. Consider this quote from a contemporary study by The Brookings Institute .

> What does make a difference is how students use technology. When students use technology in passive ways to consume media, even educational media, the positive impact is limited. But when students use technology actively, as a tool to create, to design, to explore, and to collaborate, they enable new kinds of deep, often transformational, learning experiences. (Lettvin, South, & Stevens)

And that is what I think we should be focusing on, how we use technology to transform and stir the soul as part of our prepared environments.

Seven Keys of the Prepared Technological Environment

The seven keys that make up the prepared environment, as stated by A.M. Joosten, one of Montessori's earliest students, and elaborated on by my colleagues Broz and Warrenfeltz, are not much different from the considerations of the prepared technological environment. Each of these seven keys serves the needs of the adolescent through the lenses of social independence, social acceptance, and social justice, as well as acting as an aid to practical life.

1. **Adaptability/Intellectual Environment:** The children construct themselves by interacting and adapting to their environment

2. **Social Environment:** Responds to all aspects of human development, i.e., the whole person

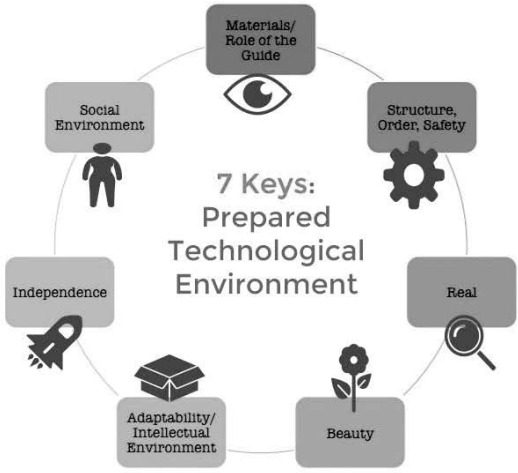
3. **Real:** Natural world vs. manmade world

4**. Independence:** Activities are prepared so that the children are challenged by them but the activities also lead to independence; difficulties are isolated

5. **Structure, Order, Safety:** Organized so tasks can be accomplished independently and successfully

6. **Beauty:** Harmony and inviting the learner to work

7. **Materials/Role of the Guide**: Be the spark and protect the space



What is different are the considerations and the guiding questions that go into each key that I will attempt to break down and elaborate on.

Adaptability/Intellectual Environment

Guiding Questions

- What can I do to help them test their sense of self?
- How do we face technological setbacks ? As teachers? As adolescents?

Social Independence

- Technology provides resources that a teacher can't.
- Students gain confidence to discover new ways that technology can solve old problems.
- Provides a platform for student-driven learning, level, and pace.

Social Acceptance

- If the world changes, it's OK if I too must change!

Social Justice

- The more I see of the world, that more I will realize that I must adapt to fit it, not adapt it to fit me.

What does technology allow for in terms of intellect? As a resource, it can provide information that a teacher can't. It allows for greater individualization and more challenging, rigorous work, that is often student driven.

The teacher embraces the idea that he/she doesn't know everything, but technology and the Internet give students access to information the teacher doesn't have. We are leading by example. We are telling our students that adaptability is something we value. This is consistent with Maria Montessori's own thoughts on the importance of teaching adaptabilities to adolescents:

> Adaptability–this is the most essential quality; for the progress of the world is continually opening new careers, and

> at the same time closing or revolutionizing the traditional types of employment. (*From Childhood to Adolescence* 61)

Remember, technology changes faster than we can master it, *you* included. I remember pagers being huge in my own adolescence, more than twenty years ago. If you were to tell me then that there would be pocket-size phones that could allow me to talk face to face with someone in the Arctic Circle and that AOL wouldn't be part of it, I wouldn't have believed you! Imagine then, what kind of technology the next twenty years will bring for our students.

It is therefore important to have a clear goal in mind that supports the prepared environment that your students need *and then* find the technology that helps you provide it. Throwing a bunch of tools in a room and telling the students to make something sure sounds amusing but it isn't practical. We need to model that in order to invent something they have to have a driving question, a burning desire to solve something. Your students should be using the technology you provide–that you think is suitable for the world that they are walking into–to tackle and solve real-world problems that validate their own inquiries, not artificial ones that we demand.

Social Environment

Guiding Questions

- How do we encourage empathy and compassion through our use of the Internet and technology?
- How do we interact online? How do we protect ourselves?

Social Independence

- Provide them with opportunities to *do* the work of repairing broken systems and embolden their sense of agency.

Social Acceptance

- Invite them to take a stance on issues.
- Insist they find solutions to offer and reflect on their exploration.

Social Justice

- Invite them to engage in the oldest questions known to humanity with others around the world.

Your goal in the use of technology and online is to create a culture of online feedback and collaboration that leads to engagement in the theater of the classroom. Show them how people are using technology to bring people together to change the world and then allow them space to create it with these tools and each other. Through this you have to create space for the success and failures of online social interactions in the same way that you would social interactions in your real life.

This also means setting limitations and boundaries. Follow your students on this. If you see them needing a check on boundaries and time spent, give it to them but not without a conversation. It's important in that conversation that they feel heard, or else you run the risk of the student not seeing you as someone who is engaged in their struggle to figure out what is appropriate for them.

Real

Guiding Questions

- How is the me that is online the same me? How are they different?
- How do I use what's happening in the world now to inform my teaching?

Social Independence

- If some of the tools that they need to master are digital in nature we must create space for the real work of independence in these areas.

Social Acceptance

- How does social media distort reality? How does what and who I see online reflect that?

Social Justice

- This is how this city looks; this is how the people speak. It doesn't replace the impact of the real visit, but it builds bridges to understanding the sameness of us all.

- Shows them the complexity, beauty, and ugliness of the adult world.

"Real" also speaks to the idea of "real and meaningful work." Does technology let students engage in the real and meaningful work of creating a civilized existence in a way that is hands-on, similar to how in-person work does?

Yes, when it is both manual and intellectual–when there is an action behind the purpose to their inquiry. Wrestling with the challenge a particular type of technology poses is one of the surefire ways innovation is born. But please don't go out and build huge buildings for this work. Start small. Find the technology that your students need and invite them to it. Perhaps it's a small robot maker space or bank of computers, whatever it is it has to be able to tackle in some form what you are asking them to study, what questions you are inviting them to solve. It is the practice of this real inquiry that leads to independence. As John McNamara has said, "Students need to see links between the material they are studying and the real world, and make connections with their own experience" (175).

> There's a great question here on the role of the guide in "guiding" students in their use of technology, but also the role of how the guide, herself, uses technology for her own work and wants to grow with it.…Part of our responsibilities as teachers is to decide if a certain technology is appropriate, when it is appropriate, and how it is appropriate. You are the gatekeeper, you know your population, your culture, you know what you need to prepare them for real work.

What is also critical then is teaching and practicing digital literacy. There are many wonderful tools out there on the Internet for free that go over such things as trusted content, bias, and reliable sources. We start the year by having our students create and sign a technology Code of Conduct that allows for a conversation when things go awry. And they do go awry at times.

Just this year I had a group of students present a poster full of Hitler quotes [shows slide to audience]. They had bleeped the *F* word, but had neglected to check if the quote came from a reliable source. If they had checked the "About" section of the website where they found it, it would have clearly told them the content was fictional and intended to be comedic. It offered a wonderful chance for us to have a conversation about how we identify reliable sources. (And it gave us a good chuckle.)

Inviting the real use of technology into your classroom is going to be messy, but if it wasn't messy it wouldn't be any fun.

Independence

Guiding Questions

- How do I remove myself from their discovery of the work?
- What tools (both personal and inquiry based) are needed to foster digital independence?

Social Independence

- Adolescents manage assignments and delivery digitally.
- Second years are responsible for being online mentors.

Social Acceptance

- We create a space for a new mastery of the work of the hand, digital mastery.
- See and be heard while still working on your voice.
- Collaboration

Social Justice

- Interactions across states, countries, languages, etc. makes us see how similar we are and not different.
- Let the adolescent tackle the problem.

How many times have you had to ask a student to show you how to use a piece of technology? There is nothing wrong with admitting to your students that you don't know how to do everything. Technology is a great way to allow a student to feel like they have something to teach you. While allowing space for them to take over, you should also be keeping in mind that you ultimately know if something is appropriate, and if the work with this technology is meaningful. The question you should be asking yourself is, "How can I be seen as both someone who they can show new things to, as well as encouraging them in discovery of their work?"

I'll never forget the first time I saw Minecraft used for a project. For their work, the students were asked to build a restaurant from the ground up, including a business plan, model, and marketing plan. One of the jobs of each team was to determine an architect and

Courtesy of David Tucker Photography

have them build according to their group's wants and needs. Every team but one was bringing in modeling equipment, fumbling with foam core and getting frustrated with scale. At one of the check-ins with the team who I hadn't seen progressing on their model, I asked how it was coming. They told me that they were building it at home and that they were excited by the progress. I asked for some pictures of what they were working on, and the next day I was shown printouts of a beautifully designed building in progress. I had never seen a program like this, let alone knew one existed that a twelve-year-old could use. I applauded the students on their outside-the-box thinking, but lamented that there weren't any sketches of how they arrived at this design. The next morning I was given handdrawn blueprints on graph paper that showed how they built it in the program. The student had shown me how to connect the manual and the intellectual with this program by simply wanting to try something new and by wanting to be independent.

Structure, Order, Safety

Guiding Questions

- How do I create a safe online space?
- What is it that I want to use technology for in my classroom?
- What do we do when technology fails?

Social Independence

- Adolescents manage and troubleshoot technology once certified.
- Create their own technological code of conducts.

Social Acceptance

- Adolescents gain validation when they are seen to be managing and teaching "adult" technological tools.

Social Justice

- How can I be an ally, in a safe way, online?

It's important in order to foster independence. You should also provide the foundation for order and safety by letting students add and subtract what they think is important. The key here is that you should be using and enforcing a technology code of conduct *with your students.* This means you need to be flexible with expectations, differentiated for each child's needs and sensitivities.

We have a Computer Overlord in our room – a title changed from Technology Monitor because the students think it sounds "cooler." A student applies to become the Computer Overlord and understands that the role includes responsibilities such as managing the fifteen laptops and printer to make sure they are all up to date, charged, and working; notifying the school's technology staff when there is a problem; and helping teach other students on computer-related tasks when necessary. The student who chooses this job usually relishes the fact that they are an expert in the room in a way that benefits their peers. You have to be prepared to get out of the way once the structure is in place. They will need limits and guidance in appropriate use but if the work is real and meaningful to them they should be leading the way.

Beauty

Guiding Questions

- How do we respect technology in the classroom?
- Where is technology's space in the room?
- How do we use technology to create beauty and art?

Social Independence

- Respect the technological tools given.
- Understand the real consequences for repair costs.

Social Acceptance

- Equity and Access: You cannot assign something that has to be done only with technology unless everyone has the same access to it and instruction for mastery.

Social Justice

- Technology is something earned, not given.
- How is what we have different than others?

A great place to start is to ask yourself two questions: "How does the space invite the adolescent to work with technology?" and "How do they provide input about what should be in the space?"

Create the space for technological surprises. Just as in the story I shared about being blown away the first time I saw Minecraft, keep an open mind to something showing up in your room that changes things, a lot. For instance cell phones have had a slow and steady creep into my classroom. They used to be something that not many had so there was little need to regulate it. But now, most adolescents in my classroom have one. So our policy evolved from keeping them in lockers to collecting them at the start of the day and keeping them in a cabinet because the students acknowledged they needed to be kept out of the way. Your response should evolve over time and should be evaluated as the proficiency in its use increases.

Have Wifi that works! Make sure your systems meets your needs. Nothing is more disappointing than having thirty students try to do something online only to realize that you don't have the broadband to support that. This is true in the larger sense as well. With that said it is at the same time a great lesson in adaptability.

Ultimately you should be modeling a level of respect for the materials and what they can do. If you get a 3D printer for your students because it meets their needs and it breaks but you leave it in the room to gather dust, this is the same as keeping an incomplete number rod on the shelf. If it can't be used it should be removed from the classroom, as dirty, damaged, or incomplete material always repels student engagement.

Materials/Role of the Guide

Guiding Questions

- In what ways do I want to grow in *my use* of technology?

- How do I decide what is, when it is, and how appropriate technology is used in the environment?

Social Independence

- Help to guide, perplex, support their inquiries.
- You don't need to know the answers.

Social Acceptance

- Celebrate their efforts relentlessly.

Social Justice

- Show them your own struggles. Let them know you are fallible.

There's a great question here on the role of the guide in "guiding" students in their use of technology, but also the role of how the guide, herself, uses technology for her own work and wants to grow with it. John McNamara has stated, and I think he is right, that part of our responsibilities as teachers is to decide if a certain technology is appropriate, when it is appropriate, and how it is appropriate. You are the gatekeeper, you know your population, your culture, you know what you need to prepare them for real work.

> That work does not hinder study, but even makes it possible to study better; in fact the students who are obliged to resort to self-help are generally those who turn out the best and most successful scholars. (*From Childhood to Adolescence* 66)

Ultimately your role as a guide to technology should be to get them to engage in real and meaningful work.

A reminder for administrators: Just as every student is different, so is every teacher. Respect each teacher's needs and tendencies. Guide your teachers to evolve through their use of technology over time, don't mandate it. A teacher's worst nightmare might be hearing there are going to be thirty iPads in his or her classroom next year. Or it could be a dream come true. The only way to know is to ask them:

- What kind of technology do their students need?
- How can I help you support the work you are doing in your classroom with technology?

At the end of the day you should focus on the front runners and the early adapters to lead the way. Start with one classroom and one teacher that is committed. The rest will follow in time.

Technology Unites Us to All Humanity

Technology can become the common denominator despite all our differences (size, location, etc.) and unite us across the world–that is what the Internet does, or can do if it is structured appropriately. For example, teachers around the world are looking to interact with other classrooms in order to highlight commonalities, be it through art, literature, or current events through the Internet. Despite where we are located geographically, applications like Google's Connected Classrooms and Skype in the classroom bring us closer to real life experts from across the globe for our students to connect with, work with and get inspired by. Ten years ago this was still very challenging, but now it is commonplace. Most families have a computer with Internet access. In the 2013 census, 74% of all households had high speed Internet access and 83% a home computer, compared to ten years prior in 2003 when it was 55% and 61%, respectively. We are more connected, if we choose to be, with people around the world than we have ever been. If this is what the past ten years brought for the Internet, imagine what the next ten years will bring for all different types of technology.

It is our task to prepare students to take advantage of all that technology offers us in order to conduct this life's work of connecting and finding the common ground with people from around the world.

> But it is essential that this training should not turn out men who have been lulled to sleep by a false sense of security, who are incapable of confronting the unforeseen difficulties of real life, and who are ignorant of conditions in the world in which they are destined to live. (*From Childhood to Adolescence* 61)

You cannot open up a computer and solve all the world's problems, even though the advent of Siri and Google can make you feel like answers are at our fingertips. This does nothing more than lull us into this false sense of security that Dr. Montessori talks about. All questions asked are not answerable in such a cut and dry manner. We must show our students how to use technology to question the known and unknown questions that reside in us, as opposed to seeking the easy answers that can be found. To invent the possible futures that they see for the world. In order to do so you must model a sense of inquiry with technology that has a never-ending loop. You have to prepare a space for the adolescent to use technology to find who they are and what they are answerable to.

If You Only Read This

> The machine is like an extra adaptable limb of modern man; it is the slave of civilization. But beware for the man of ill will may be rendered dangerous by machinery; his influence may become unlimited as the speed of communication increases. Therefore a new morality, individual and social, must be our chief consideration in this new world. (*From Childhood to Adolescence* 78)

In order for us to guide our adolescents to this new morality we have to create space for them to invent, to know, challenge, and understand the technology of today so that they can create the technology of tomorrow. This is no different than knowing the problems humankind faces today, to create the new world of peace that we are all aiming for. No one is better prepared for this work then the Montessori adolescent.

I challenge you to create the space for this brave work.

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