Chapter 3

Children’s Power for Learning in the Age of Technology

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ABSTRACT

This chapter situates discussions of children’s power for learning in the context of new media and technology. We assert that for learning to take place, children must exert their own power and take initiatives in their learning; yet, the current power structure of classrooms inhibits children from exerting their power and motivation for learning. Tracing the seminal works on power, we provide examples of children’s power in learning and argue for a power structure transformation necessary in a technology-rich classroom of the twenty-first century.

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INTRODUCTION

A class of third and fourth graders engages in a lively discussion on food chains, what eats what, and how decomposers break down dead matter, when the discussion turns to composting plant waste. “Oh yeah, we compost in RuneScape so our veggies will grow better!” Faran chimes in. Several other boys enthusiastically discuss plant matter they have virtually composted as well as other quest related tasks they encounter in this popular online game. The depth of discussion on this ecological process is amazing. There is a hefty amount of text these third and fourth graders willingly read to improve their play of this game. Along the way they are determining their own purpose for reading, encountering content specific vocabulary such as: vegetation, produce, organic, and rotting; academic vocabulary such as: treated, yield, increase, and interacting with one another online in a cooperative manner.

What motivates these young children to engage in the traditional literacy demands required by school on their own time? What motivates them to master a video game, engage in online play, or seek information on a topic that sparks their interest or curiosity?

In synthesizing an abundance of research on motivation, Daniel Pink (2009) attributes this kind of motivation as the boys’ desire to direct their own life, to improve their skill at the game, and to be a part of a large game playing group. According Pink (2009), motivation comes not from the old behaviorist carrot and stick model of rewards and punishments; instead, motivation comes from three factors: autonomy (the ability to direct our own lives), mastery (the urge to get increasingly better at something that matters), and purpose (the desire for what we do to be in the service of a larger purpose). Clearly, within these descriptors of motivation lies a sense of power. One achieves a sense of power when one is confident and capable of achieving his or her goal autonomously and meaningfully.

Our schools are on the cusp of change. As the Industrial Age gives way to the Digital Age, schools find themselves clinging to an outdated system that no longer reflects the needs of today’s citizenship, life-style or work force. The societal landscape of the Industrial Age produced the factory model of schooling. Businesses needed workers, schools provided them. Those who did not go on to college were trained to respond to bells, be on time, and do boring repetitive work. In the factory model of schooling, students are viewed as products; teachers, in turn, take on the role of factory technicians making the additions and adjustments to their products required during their year (Schlechty, 1990). There is little power in being a product - or a factory technician.

The factory jobs of the past have been automated. Even jobs that require a certain knowledge skill set, such as tax preparation, customer service, or information systems support can be outsourced to less expensive labor forces in any place on the globe with Internet access. As we struggle through this transition period of letting go of old models without yet knowing how the new model should look (McLeod & Vasinda, 2009b), educators sense the power structures of old begin to blur and the change as our students have knowledge and skills that many times surpass our own in areas of technology usage. Children remind us how to use our Interactive White boards, how to animate a Power Point, or how to join a social networking group. They are eager to teach us how to navigate digital worlds. They are in a technology world, a context that makes the discussions of the focus of this chapter, children’s power for their own learning important, even urgent.

Objectives

After reading this chapter the reader will develop an awareness of how the perception of power structures in early childhood classrooms is shifting due to the influence of technology. The reader will be able to reflect on the instructional environment
and interactions in their classrooms as influenced by the power roles of children and teachers. The reader will be able to better understand:

- Context of learning
- Power structures in schools
- Power of technology
- Information power

BACKGROUND: THE IMPORTANCE OF NEW MEDIA AND TECHNOLOGY BEING THE CONTEXT

The importance of a context has been highlighted in many historical events. History is replete with great ideas that, because of lack of the right technology, could not come to fruition. The thinking was in place long before another, in a different time, could see the idea to its successful intent. Da Vinci, for instance, designed machines capable of flight but could not build them because the technology and societal infrastructure of the day was not available (Papert, 1993). The Wright brothers succeeded where Da Vinci fell short, not because they were so much smarter, but because of their context. They had the technology and the societal infrastructure to build the first airplane.

In a similar way, because of their context, the preprimary schools of Reggio Emilia in Italy have succeeded in embracing the educational philosophies of John Dewey when we in America are still under the influence of Thorndike’s mechanistic view of quantifying the educational experience and outcomes (Gibboney, 2006). In the aftermath of the devastation and rubble of World War II, a group of parents who understood the social change in which their community had undergone wanted something better for their children (Gandini, 2002; Palestis, 1994). The landscape of war and resistance to fascist leadership was the context and catalyst for change and the desire to create a more just world that was free from oppression (Barazzoni, 2000). This Italian region’s history of solidarity and cooperation made it possible for these parents, and later a group of teachers with the guidance of Loris Malaguzzi, to create what have been referred to as the best and most innovative preschools in the world (Newsweek, 1991). Their foundational focus is the image of the child as a protagonist of their own learning. Children are seen as full of potential and capable of constructing their own learning, not in isolation, but in relationship with the family, other children, the school and the wider society. Teachers and children work together as partners in the process of learning and document their work together. The practices of Reggio Emilia provide a landscape for continuous research, analysis, reflection and action that results in the formulation of new theories, hypotheses, ideas and strategies about learning and teaching (Gandini, 2002).

Cognitive scientists and educational researchers have long noted that the context in which learning takes place is critical (Godden & Baddeley, 1975). John Dewey (1997) advocated that children’s educational experience needs to be connected to their daily experiences. Lave and Wenger (1991) suggested that all learning is contextual and situated in a social and physical environment. Situated learning emphasizes that the ongoing processes in which one is involved, for instance, the surroundings and social network of others doing the same thing, change the capacity for learning. Brown, Collins and Duguid (1989) stated that “the ways schools use dictionaries or math formulae, or historical analyses, are very different from the ways practitioners use them.” Consequently, students often do not see connections between learning in school and their real life situations, and lose interest in what they study in school.

The context today includes the ubiquitous nature of technology in our postmodern or knowledge-based society, and the continuing ease of use have opened many possibilities for learning and collaboration as well as new challenges. One facet of postmodern society and thinking is characterized by multiple voices or alternative
perspectives emerging with the rapid development of new media and social networks. Technological platforms such as Facebook, Twitter, Blogs, and Wikis have made it easy for the general public (not just authorities or celebrities) to make their voices heard and to impact public opinions and policy changes. Many of these voices are from those of underrepresented cultures, ethnicities and genders (Slattery, 1995), to which we will add the culture of youth, more specifically young children.

Living in a world of technology, new media and technology are children’s social and physical environments and are their daily experiences. Because of new media, the learning environments designed for children by educational theorists including Dewey, Piaget, and Vygotsky are now able to take flight. However, standing in the way are archaic classroom power structures that do not fit into our twenty-first century context. Therefore, in this chapter, we will begin our discussions with the current power structures in school settings, followed by understanding power through the historical and philosophical lens. Then, we will look to the power structures necessary in a technology-rich classroom of the twenty-first century.

**Power and Power Structure in School Settings**

When power is considered in a school setting, it is typically with phrases such as “empowering children.” But the term “empower” entails giving power. In other words, just using the word empower connotes that all power resides in the adults and that it is at the adults’ discretion whether or not the power is shared with the children. It further implies that power is something that can be given away. In this chapter, we will challenge these held beliefs.

Currently, educators are grappling with how to use the technology their students value, are comfortable, adept and unafraid to experiment with and use as well as keeping current with technology’s continuous invention and evolution. Phil Schlechty (2009) describes what he calls the “digital imperative” as follows:

*The revolution created by the application of digital technologies to the organization, management, processing, and presentation of information, images, data, and all manner of human expression cannot be appreciated as long as these technologies are viewed as tools for instructors. What is most powerful about them is that they place instruction under the direct control of the person being instructed: the learner. In the digital world, the learner, not the instructor, is in charge of what will be learned, as well as how and when that learning will occur.*

In his work with teachers, Schlechty (2009) found that teachers recognize that technology provides a platform for students to take a more active role in the classroom and it becomes, as one teacher quoted, “a shared space where teachers and students learn together and from each other” (Schlechty, 2009). He also found that more commonly, teachers undervalue the potential of technology as a learning tool and that it is often regarded as something to which needs to be controlled.

Clearly, power structures are deeply ingrained in schools. Therefore, it is important to begin this chapter with an understanding of power: what it is, what is embedded in the power, what are outcomes derived from power, and why it is relevant and urgent to discuss power issues in the context of technology.

**The Definition and Nature of Power in the Context of New Media and Technology**

Cartwright (1959) noted years ago that a consistent definition of power eluded the field and the ensuing fifty years has not substantially changed that fact. Cartwright himself used a mathematical
formula to depict power as the force an agent can use to influence and the resistance of that influence by a target. Yukl (2006, p. 146) similarly defines power as the “capacity of one party (the agent) to influence another party (the target).” These definitions seem to equate power with a type of domination of one person over another person. Foucault (1980), however, moves beyond these domination-themed definitions and views power as a productive network in society. He identifies power in relations of any kind, such as family, work or school. This is a view of power as socially negotiated rather than dictated. Barnes (1988) identifies power as socially negotiated as well. For Barnes, social power is akin to mechanical power in that it is a capacity. While mechanical power is a capacity for work, social power is the capacity for action in society.

It is this view of social power as the capacity for action which is especially compelling, particularly because technology has enabled even very young children to take action in society in ways that are important, public and inconceivable without the technology. Tapscott and Williams (2006) posit that for the first time in history, children are experts in something that is truly important in the adult world. Because children have these life experiences as a valued, contributing and important member of a society, they taste social power in a way that we did not know at their age. It has also expanded the number and types of societies available to children. For example, even young children can join societies such as Webkinz World or Club Penguin, the virtual worlds for kids. In virtual worlds, societies evolve in which children have the capacity to act online, and with some worlds, the societies are not limited online so the capacity to act in the virtual society extends to the physical world as well. This experience leaves an aftertaste that children find hard to set aside in other parts of their lives. Thus, for this chapter, our definition of power will be closely akin to both Foucault’s and Barnes’, that is, power is productive, sometimes consensual, capacity for action in society.

To dig more deeply into the concept of power, Parsons (1963) used an economic metaphor, money, to describe the nature of power and how it is created by society. Just as money is a circulating medium, power circulates through society. Further, like money, power is a symbolic abstraction. Parsons (1963) explained that while in earlier times, coins were made of a metal with an independent value of its own; convenience brought about paper money which then symbolized the metal that represented the money’s value. Of course now, the representational metal is not used and paper money has become fully abstract and separate from the metal that once gave it its value. It has value in its own right. Members of society may use a symbolic instrument to make obligations to others and to fulfill those obligations. Similarly, in society powerful people have the capacity to call upon obligations and secure satisfaction of that obligation. It is this capacity to act in society that is at the heart of our definition of power.

Interestingly, Freire (1970) wrote extensively about power structures and education after his experience helping people in Brazil to become literate. He also used an economic metaphor to describe the traditional power structures specific to education. In Freire’s view, teachers make “deposits” of knowledge to students. The students’ role is limited to receiving the deposits, memorizing the information and repeating it to the teacher when asked. Indeed, Freire argued that this education system limits the “scope of action (the authors’ emphasis) allowed to the students” (Freire, 1970, p. 72). Since the capacity to act is the definition of power, Freire’s banking metaphor for education in which students’ action is limited highlights a fundamental contradiction for twenty-first century educators - how do students’ new conceptualization of their own capacities for action (i.e., power) in their technological worlds synchronize with an educational system that attempts to limit their actions?
An important consideration in answering this question can come from extending Parsons’ (1963) economic metaphor for power. Banks hold deposits for customers. While these customers retain the right to access their funds at any time, the bank also has the right to use a portion of the funds to lend to other customers for a fee. Thus, at any time, two people can have access to the same funds, essentially doubling the economic value of those funds. Power is similar in that leaders may take action and make obligations in support of a particular group’s goals without draining any resources. In other words, power is not a zero-sum. An individual’s increased power does not have to come at the expense of another person’s power. Indeed, society regularly produces power to satisfy needs, desires and goals.

With this concept of power as something that can be expandable and generated, educators can begin to conceive of a classroom with the necessary power structures for twenty-first century teaching and learning: celebrating and encouraging children’s power in their learning does not reduce the teacher’s or school’s power to help children learn. Because of the twenty-first century children’s push to move their capacity to act into the classroom, it is important for educators to understand power. By doing so, it becomes possible to envision a style of teaching that honors childrens’ power while still accomplishing the established learning goals.

The Elements and Outcomes of Power and its Importance for Children’s Learning in the Age of New Media and Technology

McLeod and Lin (2010) traced the discussions of power by seminal and contemporary thinkers including French and Raven (1959), Weber (1968), Freire (1970) and Yukl (2006), and summarized eight separate types of power: legitimate power, reward power, coercive power, referent power, expert power, information power, ecological power, and power over oneself, as shown in the following figure (Figure 1):
Legitimate power occurs when an agent has formal or cultural authority over a target. Adult-child relationships in schools are governed by cultural norms that allow teachers to have legitimate power. Referent power occurs when the target seeks the approval of the agent or has strong feelings of loyalty or admiration. The agent can influence the target because the target seeks to please the agent. For example, when students struggle to be accepted by their teachers or peers, referent power is at work. Reward power is an agent’s ability to use rewards to influence the target and gain compliance. Compliance is not guaranteed with reward power as the target will continuously evaluate the probability of receiving the reward and whether the reward is worth the agent’s compliance. Many teachers use reward power in the classroom for students who follow the classroom rules. Coercive power uses threats or punishments for noncompliance and is typically considered an opposite to reward power. Traditional teachers use coercive power when they take away a privilege or threaten a failing grade.

Expert power occurs when an agent has specific knowledge or skills, particularly unique knowledge and skills. Many times, a target wants advice from another and thus can be influenced via expert power. Teachers traditionally are viewed as having expert power. In twenty-first century classrooms, expert power can also come from students. Information power is the control over information. In schools, administrators hold information power. Teachers can also hold information power over students. Ecological power is control over the physical environment or technology. Teachers have power over the physical layout of a classroom. Technology lab managers in a school might control teachers’ and students’ access to the computer lab. Power over oneself is that which one exerts over oneself. It is that internal locus of control. In a classroom, ultimately it is students who choose whether they learn a particular lesson. Schlechty (2002) believes students should be viewed as volunteers in the classroom even when their attendance is compulsory. By doing so, teachers recognize that even when students are present, they must choose to engage and learn.

As shown in Figure 1, McLeod and Lin (2010) attempted to juxtapose the elements of the typology so that these elements opposite each other presented themselves as opposite ends of a spectrum or continuum. For instance, power over oneself which can be considered a microcosm of power is juxtaposed against ecological power which can be exerted at a much broader scale. Reward power which typically entails something that is given to another is juxtaposed against coercive power which typically entails something that is taken away from someone.

The typologies offered above focus on the source of the power that stems from the agent. This is of course useful in furthering our definition of power, but equally as useful is a discussion of the outcome of the attempts at power, which focuses more on the target than on the agent of power. While Barnes (1988) warns that power should not be measured or conceptualized at the outcome of the action, certainly any study of power should include an evaluation of the result of the power attempt, or the outcome. Figure 2 depicts the outcomes of power, once again derived from seminal and contemporary thinkers such as Yukl (2006) and Freire (1970) and discussed in detail in McLeod and Lin (2010):

In Figure 2, Commitment involves the target accepting the power attempt and internalizing a change in behavior, which can be long lasting. Commitment typically results from referent or expert power. Compliance describes a situation in which the target performs as requested but with minimal effort and no internalized change. Resistance occurs when the target actively avoids and sometimes even sabotages the power attempt. On the contrary, liberation occurs as oppressed people liberate themselves through education. Liberation is viewed as a jointly negotiated reality between the agent and the target. Ideally in
school settings, teachers hope to see commitment and liberation in their student’s learning and try their best to prevent students from resisting or reluctantly complying to what’s been taught at schools.

Referring back to the source of the power that stems from the agent, we can see that the first two pairs of powers, legitimate and referent, reward and coercive powers, are prevalent and dominant in our old and current classroom structures. They present a top-down structure of an educational system that uses external forces or incentives to push students to learn. These powers may work sometimes, but often they do not. It is the second two pairs of powers, namely, expert and information, ecological and power over oneself that are changing in the context of technology. These four powers reside in children’s daily experiences and are particularly relevant in our twenty-first century classrooms. The transformational changes of these four powers in classroom settings, we believe, will bring true power to students’ learning and to their motivation for learning. Ultimately, these powers will generate in our children the two ideal outcomes of power: liberation and commitment for their own learning.

Figure 2. Outcome of power

Children’s Power in the Technological World

The following two scenarios are examples of how the power of children enhances learning in a sixth grade classroom. The technology used has changed the interactions of the class and the ownership of the information in a manner that bases the learning in the context of the digital world.

Scenario 1: Folders of Wisdom and Knowledge

The room was buzzing. Each student had a laptop and was working diligently, but not independently. Many times students leaned over to their neighbors to ask about a problem. When their neighbor could not help, the students looked around for the teacher and called the teacher over to help. “Yes!” called one student after a period of working time had elapsed. He had completed the work and was proud of all he had accomplished. Other students called out to him to come help them, but he played coy with them, telling them that they could do it themselves.

In this classroom, students were working on a math task that had just been digitized for the first time. During the previous year, the students in this math classroom struggled to organize all their mathematical knowledge because mathematics tends to be taught in small chunks without any overarching structure. Understanding that one significant difference in the way experts and novices think is in the organization of their knowledge (Bransford, Brown, & Cocking, 2000), the teacher began helping students organizing their knowledge by creating folders with pockets for the main concepts. These pockets were then stuffed over time with envelopes which represented a lower level concept and then with example questions and scenarios inside the envelopes. Students named these folders their Folders of Wisdom and Knowledge.
In the original way the folders were conceived, the example questions and scenarios were printed on index cards so that students could sort the cards into the appropriate envelope. This had been a group activity so that there was a check for students’ thinking. Students would read the card and spend a few minutes discerning in which envelope they felt the card would best fit. Then, the teacher would ask for volunteers to share their thinking. Once the decision was made regarding where the card would best fit, the class stuffed the envelope and moved on together to the next card. This was a long and laborious process, although student feedback and their conceptual and organizational knowledge showed that it truly helped them.

Now that each student had access to a laptop in her class, the teacher decided to try to automate the sorting process. She had found during the course of the year that students responded well to technology-rich work because of its individual pacing and immediate feedback. So, she created a Microsoft Excel spreadsheet and copied and pasted the questions and scenarios into the spreadsheet. She then added a drop-down menu along with some rudimentary logic to inform students if they discerned the proper concept that the scenario was addressing. When students finished the virtual sorting work, she asked for feedback about the new digital method of sorting.

Three themes emerged from this brief reflection time. First, students noted that they actually had to think. One student said, “It makes you actually think.” This was certainly a surprise because the work was the same in each case as when the students used the paper folders and index cards. However, in the manual sorting task, this student was likely waiting quietly until others offered their suggestions and then just placed the card in the appropriate envelope. This behavior would likely fit into Schlechty’s (2002) ritual compliance category in which students expend only enough energy to avoid negative consequences. These students are not fully engaged in the task and do not learn at deep levels. This comment also reminds educators that students are volunteers in our classroom (Schlechty, 2002), with the power to decide whether or not to engage in the learning. The second theme that emerged was that students liked the work better simply because it was “on the computer.” They were very clear and resounding that any work is better when they can complete that work electronically. The third theme that emerged was that they liked the virtual sorting better because each student could choose their own pace and identify when they needed to seek help. One student noted that he liked it better because it “went faster.” Several students noted that the speed was much more to their liking, noting that “you get the answer quicker.” Interestingly, this was not a digital activity in which students were completely immersed in a virtual world. It did not require a significant amount of programming or technological knowledge. But, this simple activity allowed students to negotiate their own learning, become more literate in their mathematical knowledge and certainly were seeking out experts, first their peers and then the teacher. The results of the feedback are discussed through the lens of children’s power throughout the remainder of the chapter.

**Scenario 2: Mathcasts**

“I don’t like having to show my work!” “It’s too much writing!” “I think UPS-check is just a way for teachers to torture us!” These were the statements from the students at the beginning of the school year during reflective interviews. The students were reflecting on a mathematical process known as UPS-check, which stands for Understand, Plan, Solve and Check. This process is encouraged via state mathematics standards and is implemented beginning in Kindergarten in the school district. In the process, teachers use mathematical word problems and ask students to divide their paper into four equal parts. In each section, students work one part of the UPS-check process. Clearly, students saw little value in the process and they
noted that they had to expend considerable energy to complete it. As adults, we understand that this way of thinking is important in many different realms. Yet, students must come to their own understanding of the value in this thinking process if they are to embrace it and use it.

Fast forward to the middle of the school year when we started using digital pens and special notebooks that would record words and pen strokes for the first time. These recordings could then be played back immediately and/or uploaded online creating a movie that could be embedded into websites or blog posts. These recordings were called Mathcasts (McLeod & Vasinda, 2009b). Students were partnered and given a choice of word problems to solve. One partner was the solver and the other partner was the interviewer. The interviewer used a protocol to ask questions of the solver and assisted as necessary in the problem solving process. The interview protocol followed the same questions that students had used for years to guide their thinking through the UPS-check process. Once a problem was solved and recorded, the partners switched roles. A group reflective interview was conducted after this first Mathcast was completed.

One student noted, “I like showing the work.” Another student said, “I like putting the important things before solving the question.” A third student expressed that he liked “showing how we know the answer is correct.” Interestingly, these students expressed that their favorite aspects of the Mathcast were the same aspects that they disliked about UPS-check in our first reflective interview. While some of the difference might have originated from work we did throughout the first semester which invited students to find their own meaning in the UPS-check process, we found that this means of recording words and writing resonated with students as more authentic than the written word alone (McLeod & Vasinda, 2009a). During this process, students were co-creating knowledge by recording Mathcasts that were posted online for others to view and they clearly identified the difference between this work and the work on paper. Another theme that emerged from the interview data was that students could identify their own mistakes by listening to their thinking or by discussing with their partner. In this way, students were negotiating their own learning while becoming even more literate in the UPS-check process. Indeed, Vygotsky (1986) posits that learners mediate their understanding through discussion and that conversation with others becomes internalized into private speech and then the thought process becomes automated.

In both scenarios, students had different reactions towards their learning process when using digital technologies as compared to using the traditional tools. Obviously, situating their learning in their own context – the technological world, has played a role in their excitement for learning. Yet, something else, namely, students’ power, has also played an important role in the process. In the following, we will discuss the ecological, expert, information, and power over oneself that the students exhibited in the two scenarios.

**Children’s Ecological Power**

Ecological power is control over the physical environment or technology. Children today are the most technology savvy of any generation. A recent report by Kaiser Family Foundation found that 8-18 year olds in the U.S. spent 7.38 hours on media daily, and that these young people packed a total of 10 hours and 45 minutes worth of content media into 7.38 hours of media use (Rideout, Foehr, & Roberts, 2010). In fact, children spend more time with media than they do with parents, teachers, physical activities, and homework combined.

During their work on virtual sorting for their Folders of Wisdom and Knowledge, students strongly communicated that any work is better if it is on the computer. In this statement, students were clearly identifying their ecological power within the technological context. When they had
control over their environment, they felt more deeply connected with their work. To these students, technology-rich learning was a natural way to feel the control over their environment. Further, students enjoyed the work more because they could work at their own pace, again citing ecological power as an impetus for their deep engagement. The students who created Mathcasts also recognized their ecological power. For these students, the UPS-check process was “torture” when it was completed using a pencil and paper. However, when these same students completed the UPS-check process using the digital pens, they felt drastically different about the process. So different that they noted how much they enjoyed the exact same aspects of the process with which they had expressed disdain earlier in the year.

New technologies have become ubiquitous in the lives of young children. Technology, which can be anything from a pencil to a phone to a computer, is not simply a tool in terms of hardware or software for children who use it. Rather, it is meaningful, both for those who create with it and for those who use it. For children living in the technological world, the boundary between creation and consumption has become blurry. Technology creation and consumption are integrated in their lives, their friendships, and their sense of what is important to them.

Children’s Expert Power

Along with children’s ecological power over technology comes their expert power. Expert power refers to specific knowledge or skills. Children are at the front of technological knowledge and skills. Technology presents a landscape of possibilities and power in which children can and do willingly participate unlike any landscape of the past. They pretend and play, research and report, consume and create on virtual platforms where they are comfortable, proficient and engaged. They have been called “digital natives” (Prensky, 2001) as they have grown up in a world in which much is possible. Because of their fearless tinkering with technology, they often mentor adults in navigating technological media and applications.

Children’s expert power was observed during their virtual sorting work on their Folders of Wisdom and Knowledge. Students were working both independently and collaboratively seamlessly. When they were unsure, they typically sought help from their neighbor. Sometimes they also sought help from their classmate across the room, making for a lively sounding classroom! Finally, they sought help from the teacher. This was not a process directed by the teacher, but was naturally occurring among students. Similarly during Mathcasts, students noted that they appreciated the partner discussion and the interview questions so that they could find their own mistakes. Once again, students naturally asked peers for help. When the pair could not decide how to proceed, the teacher was called over for assistance. These examples demonstrate students’ innate ability to identify experts and seek assistance. This is a naturally occurring process for children in their worlds outside of school. For example, children playing a game such as Sonic the Hedgehog first exercise their power to act in the world. When they find difficulty, they then seek assistance. This assistance can come from in game characters or from elaborate societies of cheats and help sites online.

Vygotsky (1978)’s work bears relevance, especially his notion of the zone of proximal development (ZPD), or the difference between one’s actual and potential levels of cognitive development. ZPD can be achieved when children are collaborating and achieving the same goals together. In a technological world, a child can find someone who is just a few steps ahead in learning how to deal with the environment, someone who still speaks the same language and makes the same mistakes, but at the same time, someone who has achieved a few of the same things that he or she wants to achieve. Since they can communicate most of it rather easily because of technology, it becomes a naturally occurring process to attempt action,
seek assistance and learn. On the other hand, it is equally important to be able to turn around and find someone a little behind, because this time, the child gets an opportunity to articulate the achievement by explaining and re-explaining and making it clear to someone who is asking him or her. In Rogoff’s (1990, p. 16)’s words: “Children seek, structure, and even demand the assistance of those around them in learning how to solve problems of all kinds. They actively observe social activities, participating as they can.”

**Children’s Information Power**

Information power is control over information. Researchers have known for years that children can use technology to obtain information at their finger tips (Perkins, 1985). Certainly this access to information is a type of information power. However, this is still information to which others also have access. Children now know that information power is more intense if they are the ones creating the information or content and then deciding how and when to share that information. During virtual sorting work on their folders of wisdom and knowledge students demonstrated their sensitivity to information power in a unique way. If a student was able to figure out a question or scenario before his or her neighbor, he/she would have information power. Because of this, students did not wait idly for others to do the thinking; instead, they actively engaged in the thinking themselves. Further, the students also noted that they appreciated moving at their own pace. This individualized pacing increased some students’ information power because they had already worked through a question and could be a more capable other for their neighbor (Vygotsky, 1978). During the Mathcasts, students began finding value in the UPS-check thinking process because they were co-creating knowledge that would be available to others online. Indeed, students were creating information and deciding when and how to share that information, which is the essence of information power.

Gee (2003) makes a strong case for the strength of the learning experiences in video games and identified 36 learning principles found in good video games. Without using the terminology of information power, two of Gee’s principles speak to this type of power. One of the principles is the Dispersed Principle, meaning that learners share knowledge outside the game. Another principle is the Insider Principle in which the player is an insider, a teacher and a producer. Both of these principles are seen in our scenarios, particularly in the Mathcast scenario where students were creating a video of their thinking to share online. Gee believes that the learning principles in video games offer educators a glimpse of the types of experiences available to students outside the classroom and his text includes a plea for educators to move children’s classroom experiences closer to their game-play experiences.

**Children’s Power Over Themselves**

Sometimes called intrinsic motivation or internal locus of control, the essence of power over oneself is that students are choosing to engage in the hard work of learning. When learning becomes less other directed and more self directed and more self directed, students take more ownership of the process and the content (Knowles, 1975). Students demonstrated their power over themselves in several ways. During their folders of wisdom and knowledge work, students appreciated the fact that the work was completed digitally and that each student had a laptop to complete the work. These two aspects combined demonstrate an internal locus of control that is important for students if they are to take ownership of their learning. When working on Mathcasts, the students liked identifying and correcting their own mistakes, sometimes by listening to their own thinking via the digital pen technology and sometimes in collaboration with their partner. Certainly, rework is a difficult
part of the learning in school. From editing a piece of writing to checking the work on a math problem, students resist the rework because they see it as monotonous. In their opinion, they have done the work once, why should they do it again? By using the digital pens and listening to their own thinking, students found their own power over their work and their learning. Equipped with this power, students naturally enjoyed the typically painstaking process of rework.

**FUTURE TRENDS: LIBERATION AND COMMITMENT AS OUTCOMES OF CELEBRATING CHILDREN’S POWER**

The world is rapidly changing with new media and technology. Children are developing knowledge and expertise in the technological world, but schools continue to operate in a way that fails to leverage the technological changes that increasingly influence children’s lives (Squire & Jan, 2007). Classrooms remain dominated by print-based materials produced by teacher-centered pedagogy, where students are positioned as passive and powerless receivers.

Because of the drastic change of our technological landscape, we should consider the transformation of power structures in classrooms: to do something new that has never been done (Schlechty, 2009). When the landscape changed for the people of Reggio Emilia, they transformed their schools to fit their vision of something new they wanted for their children. Recently Diane Ravitch, former assistant secretary of education and long-time supporter of the standards and accountability movement, has changed her position in regard to privatization and charter schools, standardized testing, and punitive accountability. She has now come to believe, the result of over forty years of research, that the bottom line business model put into place by policy makers has grievously harmed our educational system (Ravitch, 2010). Maybe the time is right to turn away from the mechanistic thinking of Thorndike and create the landscape of high quality experiences of Dewey. The landscape of the Digital Age could be the catalyst that can place the children at the center of their own learning experiences.

In Gee’s (2003) analysis of good learning in video games, he identified the Probing Principle. This principle situates learning as a cycle of actions, including probing the world, reflecting on the action, and forming hypotheses that are then tested as the cycle begins again. Gee’s Probing Principle mirrors Freire’s (1970) concept of praxis which is also a process of action and reflection. Freire’s concept of praxis, however, predates video games. And, importantly, praxis is the process that Freire contends leads to liberation. Certainly, the teacher and students involved in our scenarios experienced liberation. They discerned a new reality in which mathematics is connected to the world, lived and embodied through action.

When children experience school learning in a way that is congruent with their out-of-school learning, they respond with deep commitment. Further, these new power dynamics allow both the students and the teacher to discern a new reality, demonstrating liberation (Freire, 1970). Importantly, Freire (1970) reminds us that when oppressed people experience liberation, they do so not only for their own benefit, but also for the benefit of the oppressors. Through liberation, both oppressors and the oppressed become fully human. Children can already taste this reality in their worlds outside of school. It is now time to move the feast of liberation into the important realm of school learning.

**CONCLUSION**

Dewey (2001) and Vygotsky (1978) contend that learning is a social process. Power is a social dynamic. Studying knowledge, cognition and learning is studying social theory (Barnes, 1988). Thus, this evaluation of classroom power
dynamics in today’s society is a worthy effort. Children nowadays experience ecological power, expert power, information power, and power over oneself in their daily life of new media and technology. These powers afford children the natural motivation for learning. Therefore, these powers should be incorporated into the classroom and become the dominant forms of interactions in the classroom of the twenty-first century. Indeed, Bennis (2003) contends that today’s leaders must understand that power now follows ideas rather than position and we believe that this is true for young people as well. Further, it is these types of power that are involved in the zone of proximal development (Vygotsky, 1978) as more capable others assist learners. With such a classroom power transformation, we can expect that our children will present the outcomes of power that we as educators hope to realize: their commitment and liberation for their own learning.

Reflecting on Children’s Power for Learning in the Age of Technology

This section gives you some questions and activities to help you think about how you can use some of the ideas from this chapter in your work.

Research

1. In your classroom observe which learning enables children to demonstrate their ecological power, expert power, information power or power over oneself to determine if the ideas in this chapter are supported. Video children as they work in different learning centers including one where an adult dictates the steps of an activity and one where children initiate actions. Keep a tally of how many and how long children participate in each type of activity when given free choice.

2. Place a digital camera, cell phone and PDA in a learning center without specifying what they are or how to use them. Video the interactions of children with these devices. Analyze how the children interact with these.

Reflect

1. Living in a world of technology, new media and technology are children’s social and physical environments and are their daily experiences. What does this statement imply for your classroom environment?

2. Schools continue to operate in a way that fails to leverage the technological changes that increasingly influence children’s lives (Squire & Jan 2007). Prepare a concept map of your educational environment which includes technology that children use in their daily lives and in your classroom.

3. Living in a world of technology, new media and technology are children’s social and physical environments and are their daily experiences. What actions have you observed your children doing that support this statement?

4. As the industrial age gives way to the digital age think about your beliefs about learning. Are you still approaching teaching like the “banking system” of learning? How do your views of learning inhibit or support technology in your classroom?

5. What aspects of Reggio Emlio are incorporated into your classroom? Why would you want to use his approach in relation to technology?

Practice

1. Students respond well to technology rich work because of its individual pacing and immediate feedback. How will you use this
idea in your classroom to give children the opportunity to expand their learning?
2. In twenty-first century classrooms, expert power can also come from students. How will this idea inform your practice? Develop a list of ways you will allow children to explore their power.

One achieves a sense of power when one is confident and capable of achieving his or her goal autonomously and meaningfully. Identify what activities you use in your classroom that supports autonomy of children. Develop more ways you can provide an environment to support this through technology.

REFERENCES


Newsweek. (1991, December 2). The 10 best schools in the world and what we can learn from them, (pp. 50-59).


