

## artigo

# Growing up in the digital age: Areas of change

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### Abstract

Many new tools and mediations are at today's children's avail that we couldn't dream of when we were growing up. And yet, the millennium generation is also facing new challenges, which call for creative solutions. Today's youngsters are growing up in a world increasingly shielded from nature; of ever more busy work and entertainment schedules; longer commutes; disappearing or reorganizing neighborhoods; and recomposed families. And yet the children are extraordinarily resourceful. They invent their own surprising ways of navigating rough seas and seizing opportunities. Much can be learned from their interests and genres of engagement. This chapter identifies six areas of change that seem to inform how today's kids play and learn, and, more generally, how they see themselves, relate to others, dwell in place, and treat things. Together, these areas offer a framework to rethink some of our own assumptions on what it means to be literate, knowledgeable, and creative; thus opening new venues for designers and educators to cater the native's strengths while, at the same time, providing support for what they may be missing on, if left drifting on their own.

*Keywords: Learning; Digital technologies; New media ecology; Participatory cultures; Literacy*

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## 1. Introduction

We are wary of claims that polarize the divide between so-called “digital natives”: people born after 1980, and what Marc Prensky refers to as “digital immigrants”: people born and raised in the post-Gutenberg / pre-digital era (Prensky, 2001; 2005). This said, we clearly are witnessing an unprecedented cultural shift, or epistemic mutation, the symptoms of which are only magnified in today’s youth’s interests and genres of engagement. We call the changes “epistemic” because they form the core of how a culture, or sub-group, comes to define what it means to be literate, knowledgeable, intelligent, creative—and what it takes to become so.

Today’s students are in many ways similar to the students we were. Yet, as a generation, both the learners and those in charge of their upbringing are likely to develop new ways of building and validating knowledge; of exploring, expressing, and sharing ideas; and of using the tools at their avail to find a place and voice in the world. Unlike grown-ups, however, youngsters’ playfulness, curiosity, eagerness to learn, and genuine openness to any new kinds of cultural mediations (ex: digital technologies) makes them early adopters of a special kind.

## 2. Kids yesterday, kids today: Same or different?

There are things we all share as humans no matter our age, background, personal style, or generation. People need to be heard and respected for who they are. They need room to explore, grounds to settle, and friends to share the fun and sorrows with. Children in particular deserve to be given a second chance when they fail, and safe heavens to freely explore, revisit, recast, and come to grips with otherwise “dangerous” ideas (playgrounds). They need elbowroom to err (Spielraum in German), orientation devices to keep their bearings (compass, directions), and anchors not to get lost in their journeys (holding structures). They need caring others besides efficient tools.

We also know that each person is unique, in part because of her upbringing, family history, personality, or gender identification, usually a combination of factors. There are many ways in which individuals engage the world, see themselves, and leave their mark. Parents often refer to these unique traits as their child’s character or personality, which, in their view, was there from the start and hasn’t changed much over time.

There are age-related interests and abilities: things that youngsters of a given age, or developmental stage, are likely to share among themselves, no matter their personal style, gender, or when and where they were born. For example, a toddler typically will get things

her ways differently from a six-years old. She may use screaming instead of words. Likewise, a 3-years old won't reason in the same ways as an 8-9 years old or a teen.

Lastly, there are generational traits that, in some cases, mark entire generations of people, as was the case with the beginning of writing and, later, with the introduction of the printing press, and as was the case for baby-boomers or children who were raised in war zones. Research on digital natives (also referred to as the millennium generation) is fairly new, and sometimes contradictory. Yet there is growing evidence that today's children indeed interact with one another, and the world, in ways that are different from the ways we did growing up.

### 3. Who are the natives? What's to be learned?

We have identified six areas in which there seems to be more going on than just another variation of the same old generational gap. Each constitutes a dimension that, in conjunction with others, informs how the natives play, learn, create. Each captures a core *trait* that was empirically validated in many research findings. Together, these traits provide a framework that may help designers and educators to better understand today's youngsters' needs, appreciate their contributions, and if needed, jointly find ways to restore a balance. Dimensions are:

1. Sharism - new ways of *relating*
2. Shifting identities - new ways of *being*
3. Border-crossing - new ways of *moving between worlds*
4. Literacies beyond print - new ways of *saying it across time-space*
5. Gaming or "simuling"- new ways of *playing it safe*
6. Bricoleurs makers, hackers, hobbyists – new rapports to *things*

1. Sharism— New ways of *relating* – a growing precedence of co-creation over individual construction and personal elaboration.

Myth 1. Digital natives are *loners* and *geeks*. They rather play on their own, and many are socially awkward. Not really! Today's kids are as social as ever, often better than we were at negotiating wants and needs within elected circles of trust. What does changes is *with whom* they like to interact, *what* they like to share, and *how* they share it. Much they can teach us!

More than in previous generations, today's children seem to be proceeding "outside in" instead of "inside out". Boldly put, they don't first think and then act, or first try out things for themselves and then share them with others. Instead, the children mingle before they make. They share before they think! Digital natives are known for launching half-baked ideas and creations—either found or self-made—which they then bounce around, often at a fast pace, instead of keeping them to themselves. Needless to say, such open sharism calls for

trustworthy allies: a reliable group of acquaintances, and somewhat blurs the divide between so-called interest- and friendship-driven genres of engagement. (Ito et al, 2009). Friendships form around shared interests and interests evolve through friendships.

Photo 1 – Sharism: New ways of *relating*



Source: Edith Ackermann

2. Plural identities / Fluid selves— New ways of *being* - shifting boundaries between ME and NOT-ME—where I/mine ends and you/yours begins (skins); what gets incorporated (taken in) and projected (objectified, seen as other).

More than in previous generations, today's children exist and evolve in multiple realms (physical, virtual, digital). Their sense of self is at once more fluid and more distributed. In their play, the children may take on different personae, or roles, which they then incorporate as a host of voices-within. Clearly, putting on a mask is not new (ex:

Myth 2 –Today's kids wear so many hats and switch hats so fast: they don't know who they are! Parents, educators, and researchers wonder if the kids' infatuation with all things digital is a threat to their identities. Answer is: not if the contexts in which they dwell are bounded, safe, and understood as such by the players<sup>1</sup>; not if they enjoy a life off-screen besides getting immersed in cyber-space. Today's children are no more strangers to themselves than we were. They enjoy new opportunities to enact and work through aspects of their identities, otherwise unexplored. Noticeable is a growing sense of *who one is* that embraces and composes with multiple and sometimes conflicting potentials of being, or "possible selves", and this in turn calls for recalibrating idealized, virtual, and "real-life" experiences of self.

carnival, "balmasqué") yet digital environments have this particularity that they let you wear several hats at once! In other words, you can simultaneously explore different aspects of self in varying contexts, often shielded from one another. And in each you will be taken at face value. The challenge for today's children is to invent ways of striking a balance between

“spreading themselves thin” and staying true to who they are (setting boundaries, keeping their identities)<sup>2</sup>.

Photo 2 - Shifting identities: New ways of *being*



Source: Edith Ackermann

3. Border crossing / Nomadism – New ways of *moving between worlds* — Expanding territorial borders. Take a walk on the wild side. See what’s on the other side. More than in previous generations, today’s children live their lives *in between, on the go*. They move between worlds (virtual, physical, digital), and they do so even if they are stuck in place... Also referred to as “neo-nomads” (Abbas), they often feel *at home* in more than one place or, alternatively, they may not settle in any place in particular. Their urge to cross borders, geographic and cultural, and to see what’s on the other side of the fence, engenders a deeply felt sense of belonging to a ‘global village,’ which challenges the notions of home and territory as we know them. The children’s equally strong urge to feel rooted (everyone’s timeless need to find a place they can call home) has to be re-invented, which the “natives” are working very hard at achieving (and is not easy to achieve) while on the go.<sup>3</sup>

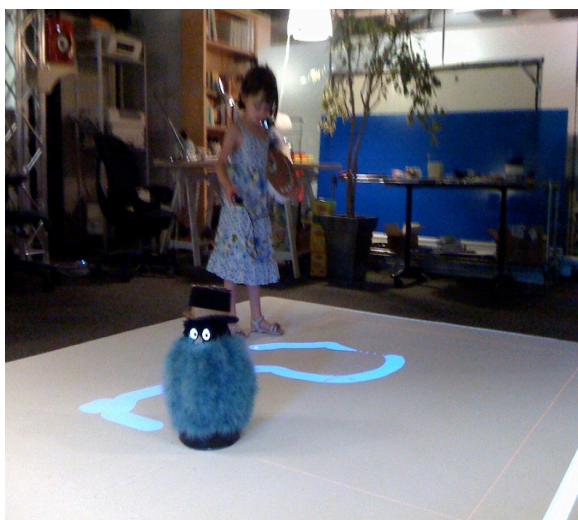
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<sup>2</sup>“Identity” refers to distinct personal traits that are *persistent*, or stay unchanged, over time and across contexts.

<sup>3</sup>Today’s children’s places of predilection are woven into a distributed network of inter-connected paths and locations. Some seek their grounds in virtual habitats. Others carry the stuff they care about (heavier backpacks), and ask for cell-phones and other devices to keep connected while on the go. Others yet, especially kids who live in split or recomposed families may ask each parent to buy a preferred toy or device so that “it” awaits them wherever and whenever they will stay over in their place.

Myth 3 - Digital natives are *couch potatoes* and yet they won't stay put in class! Yes and no. Indeed many kids are spending too much time staring at TV/ computer/ I-pad, or I-phone screens, as well as standing in elevators, escalators, or sitting in cars and on a desk. As do their parents! This said, today's generation is also the first to fall for any occasion that lets them reclaim their bodies and occupy their physical surrounds in new ways (Wii, location-based devices, mobiles, flashmobs). They love to skate as much as they roam on line. They are thrilled to hang out in town as long as they remain connected.

Photo 3 - Border-crossing: New ways of *moving between worlds*



Source: Ryan Wysort

4. Literacies beyond print— New ways of saying it! Changes in what it means to be literate and, as a consequence, a literate thinker. Read to write, write to speak, speak to write. More than in previous generations, the gap is closing between reading and writing, as well as between speaking and writing (Ong, 1982; Olson, 1994; Lankshear, 1997). With the help of digital presentation and editing tools, writing can become a quick assembly of cut-and-pasted fragments, a blending of text, images, and sounds, while reading turns into a meticulous act of highlighting, earmarking, and extracting bits for later use. Annotating and editing are

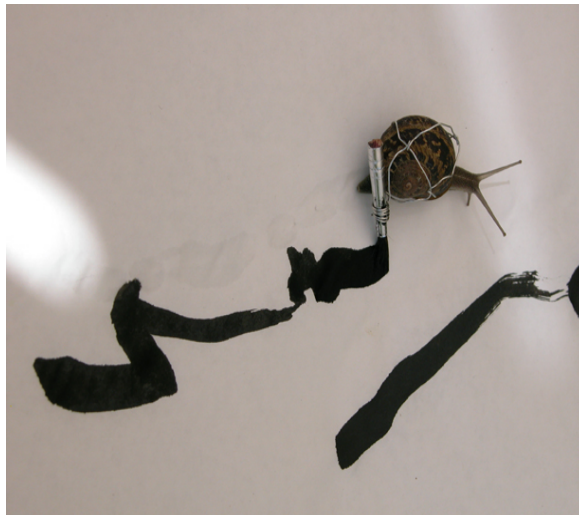
Myth 4 – Today's kids are illiterate! Can't read or write, let alone spell! All they do is "text"! Misleading. Today's children may not care to spell as they write-to-speak, but they sure know how to cast their tales on screen. Many create their own blogs, comment on friends' Facebook entries, and engage in on-line forums. They invent new genres of writing. If nothing else, digital natives are helping us rethink what it means to be literate in the digital age.

overriding notations (making notes and producing text)<sup>4</sup>. "Texting," on the other hand, is about *writing to speak*, and since writing is slow, today's youngsters (and increasingly adults)

<sup>4</sup>Dan Perkel stresses the importance of copying and pasting code, even in programming. He calls this form of production, "copy and paste literacy" (Ito, et al, 2009, p. 23).

invent ways to speed it up.<sup>5</sup> Today's authors rarely start from scratch, or stick to their creations for long. Instead, they *borrow* from those who inspire, and they *address* to those whose opinions matter. And if time permits, they reconfigure, repurpose, and remix incomes to leave a mark, or add their signature. A big problem among educators today is to come to grips with what they view as "plagiarism": students' tendencies to pick-up and pass-on ready-made imports that have not been "massaged" long enough, or mindfully engaged<sup>6</sup>.

Photo 4 - Literacies beyond print: New ways of *saying it across time-space*



Source: Karen Wilkinson

5. A culture of gaming or "simuling" – New ways of *playing it safe* - A growing expectation that the tools at hand be responsive and forgiving, i.e. that they let you experience things as-

Myth 5 - Gaming and simuling are escapes from reality. Not really! Games, like play, are more like a vacation. They offer a *voieroyale* into the realm of "altered possibilities" which allow to return to "real life" better prepared, refreshed, stronger. Whether we chose to play dolls, build a sand castle, invite friends to our house, or play video games, the appeal is to step into a world where things that intrigue us are at once distorted and mirrored. Kids use fantasy not to get out of but into the world. They make up fictions, or dramatize everyday events, in order to de-dramatize the sometimes hard-to-handle reality! Intelligence itself, to Piaget, is about establishing a dialog between what is and what could be!

*if for good* yet you are always given a second chance!

The use of the word "simuling" requires some explanation. Unlike "simulating" which implies the faithful reproduction of an original in an attempt to mimic an existing reality (e.g.,

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<sup>5</sup>The only rule here is to be understood by one's friends, so emoticons and abbreviations are seen as legitimate.

<sup>6</sup>It is our view that borrowing and addressing are quite OK as long as incoming bits are being "massaged" long enough to be owned. Iteration iteration! And taking the time to do things....

a professional flight simulator), “simuling” is meant here as the creation of an alternative world, virtual or physical, that is ‘true’ or believable in its own right<sup>7</sup>. Examples include a ferris wheel in an amusement park, a wind tunnel in a science museum, a SVE like second-life, and a microworld, as defined by Papert (1980). More than in previous generations, today’s children expect the tools they use to provide them with immediate feedback, and more important, the tools should let them undo previous moves (recover), and keep track of what they are doing (record, to be able to revisit later). This *resilience* of tools (attentive, responsive, forgiving) breeds a culture of *iteration* (try again) and *playful exploration* (go for it, no move is fatal) in ways that pre-digital tools hardly could. Ironically, however, the more we rely on tools as our extended memories, the less we go-back to debug. We build on top!

Photo 5 - Gaming, or “simuling”: New ways of “*playing it safe*”



Source: Edith Ackermann

6. A culture of bricoleurs - makers, hackers, and hobbyists – New rapport to things — *Making things*, making *things* “*do things*”. Repurposing, mending, and trading things.

More than in previous generation, today’s children are *bricoleurs*— a new bread of *makers, hackers, and hobbyists*—eager to gather, collect, create, and trade objects, preferably tangible although not necessarily. A bricoleur, as portrayed by Levi Strauss, is a

<sup>7</sup>French philosopher Jean Baudrillard (1981) distinguishes 4 steps in the process of creating realities: (1) reflection of reality, (2) perversion of reality; (3) pretence of reality, and (4) simulacrum, which to Beaudrillard “bears no relation to any reality whatsoever.” Another French philosopher, Gilles Deleuze sees simulacrum (4) as a royal venue by which accepted ideals or “privileged positions” can be challenged and overturned.



“jack of all trades” who knows how to *make do with whatever is at hand*.<sup>8</sup> Like today’s authors, today’s makers like to tweak the things they find, endowing them with a second life or extra “powers”. And as they grow older and perfect their technical skills, they often engage very deeply in the art of *making things* (crafting, fabricating), *making things “do things”* (controlling, programming), and repurposing things (remix). It is mostly their confidence in and knowledge about how to fix and mend things, together with a belief in the benefits of iteration (layering, refining), that hold the potential to breed a new culture of crafting. If given a chance and provided appropriate support, today’s kids won’t merely consume and dispose. Instead, they will create and recycle. They will care!

Photo 6 - Bricoleursmakers, hackers, hobbyists: New rapports to *things*



Source: Edith Ackermann

Today’s kids act before they think. They have the attention span of a gnat. Not really! Research shows that, if interested, the natives do more than just “hanging out”<sup>9</sup> (peer-to-peer socializing) and “messing around”<sup>10</sup> (hands-on exploration, tinkering): They “geek out”<sup>11</sup> (a deep, long, and often shared dive into whatever they care about). Granted, digital natives

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<sup>8</sup>Comparing the bricoleur and the engineer, Lévi Strauss (1962) portrays the “bricoleur” as being adept at many tasks and putting preexisting things together in new ways. The Engineer, in contrast, deals with projects in their entirety.

<sup>9</sup>‘Hanging out’ is defined as a “general shift from given childhood relationships, such as families and local communities, to peer and friendship centered social groups. Hanging out involves socializing and discussing movies, music, TV, shows and games. (Ito et al, 2009. p. 14)

<sup>10</sup>‘Messing around’ represents the beginning of a more intense, media-centric form of engagement. Messing around is about tinkering, exploring and extending the understanding of the technology. It is about trial and error.(Ito et al, 2009, . p.20).

<sup>11</sup>‘Geeking out’ is a more serious genre of engagement in which a young person is trying to perfect a creative work or become a knowledge expert in a specific and often idiosyncratic area of interest”. (Ito et al, 2009, p. 24). It is about digital crafting.

rarely do just one thing at the time, or one after another! Instead, they pursue multiple threads, iteratively. They multi-task. This said, if given the time, they'll dig deep.

To conclude, while not all youth may exhibit the "neomillennial" traits as here described, the trends are significant enough to be worth paying close attention to. This is especially so at a time when larger societal efforts are being undertaken to address some of the gaps between the interests and genres of engagement today's children and the older folks in charge of their upbringing.

### 3.1. Implications for designers and educators: What support for the natives?

There is much talk about 21<sup>st</sup> century skills these days, and much research is being fueled into redefining what today's youngsters *ought to know* in order to become active and successful players in tomorrow's world (Jenkins, 2009; Weigel; James; Gardner, 2009). While important, such guidelines often emerge from adult projections<sup>12</sup> and as a result, they tend to downplay what the youngsters themselves are contributing. Being a Piagetian at heart, I am first and foremost interested in what the natives themselves bring to the table, and what to make of it, from a psychological perspective. Below, a few reflections how to cater the natives' strengths while, at the same time, providing a holding structure for what they may be missing on if left on their own?

### 3.2. Cultures of participation, new media uses, and craftsmanship in the digital age

"Digital natives", we have seen, entertain an *altogether different rapport* to one another and to the world—man-made or natural, digital or physical, animate or inanimate. This, in turn, brings about new ways of being, thinking and doing, and new expectations that ideas and artifacts can be borrowed, re-purposed, and recycled; that body and places can be reclaimed; and that tools should be responsive and forgiving. Questions remain: How to live a life *in-between* and still feel rooted and centered? How to stay connected while on the go? What to carry along or leave behind? How to share and with whom? What does it mean to settle in a place that is temporary, not yours?

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<sup>12</sup>Partnership of 21<sup>st</sup> century skills and Route 21 companion <http://www.21stcenturyskills.org/route21/>. describe a range of abilities, competences, values, and mindsets, in 3 areas of human endeavors: life and career, learning and innovation, and information media and technology. The framework offers an integrated vision for student outcomes: a blend of content knowledge, specific skills, expertise and literacies, based on key areas identified by education and business leaders as critical to success; and the support systems needed to produce these outcomes".

Culture of participation. “With social networking sites like flickr, myspace, facebook, and devices like cell-phones, it becomes easier to start and sustain a group [...] it is easier than ever to form and join groups: the group form and dissolve fast. They are flexible” (Gee, 2009, p. 20). *Sharism*, *Liquid selves*, and *border-crossing* all encourage empathy and openness, which are essential to the formation of peer-groups. Persistence and loyalties, on the other hand, have to be re-invented.

New forms of expression and media use. Today’s media ecology both enables and legitimizes children’s natural tendency to “speak in a hundred languages”<sup>13</sup> (Malaguzzi, 1987), changing forever how we think about authoring. “Growing up digital” also breeds a mindset of playful risk-taking and *make-believe* that values *making things up* as much as *making* things! “Digital tools are changing the balance between production and consumption as well as participation and spectatorship” (Gee, 2009, p. 20). Theater and performance find a new place besides writing.

-Craftsmanship in the digital age. While digital technologies open up new possibilities for today’s bricoleurs to breakdown objects into subparts and reassemble them in an attempt to curtail, or recuperate from this breakdown, hacking alone won’t make for a culture of caring (Sennett, 2008). In other words, even “doers” can be careless if “hurried”: Things well done require slowing down, dwelling in, looking around, and composing with what’s there.

## 4. Guidelines for designers and educators

The genres of engagement that prevail among today’s youth involve new approaches to ‘writing’ or authoring as well as new ways of controlling, sensing, and modeling the world.

They also call for new ways of tackling issues of agency, mobility, and connectivity—both online and off-line. Below, and to sum up, a few recommendations, based on Prensky’s advise to fellow teachers.

- *The edgeless school.* Learning happens everywhere and all the time. Life-long learning has become a must and school is only one place where learning happens. Build bridges between youngsters’ lives in-and-out of school, on- and -off line. Invent ways for students, parents, and educators to meet, play, and learn together. Open up time for enjoyable encounters. Design spaces to settle and conditions to move in-and between spaces.

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<sup>13</sup>The expression was introduced by Loris Malaguzzi et al (1987) in a book of the same name. To him, children have always spoken in a hundred languages. What is different today’s multi-media culture is that being literate is no longer equated to the mastery of writing alone.

*Dwell in, care, and compose with what's there!* The degree of stickiness of a place depends on one's ability to recreate ties and inscribe memories, what makes a place home (Abbas). Give natives ways to settle while on the go and incentives to come back to the spaces they traverse. Imagine ways for passers-by to leave their marks. Encourage a sense of 'caring' for things and places. Design spaces—or events—that bring together folks who wouldn't otherwise meet to do things they wouldn't otherwise do (third places, stages, rituals)

*New media, new quests.* Especially in education, technologies are not always used in ways that are engaging. Resist educational software packages that come in the form of interactive versions of schoolbooks or, worse, canned edutainment packages that promise miracles through "fun" drill-and-practice. Instead, start from the students' infatuation with cell-phones, games, or computers; identify what they are good at; and rethink what you can do together to promote learning. Design environments for all to design in.

*The hundred languages of children.* Children speak in words, gestures, and images, and they know how to "say it" differently when they play together or sit at the diner table, when they tweet or write to their teacher. Don't force students into a single mode of sharing and reporting ideas (like hand-writing, e-mailing, blogging, or 'texting'). Instead, help them explore the pros-and-cons of different modalities of expression and communication (such as synchronous vs. a-synchronous, text-based vs. speech-driven; ephemeral vs. permanent)<sup>14</sup>.

*From search to research:* Today's students are master browsers yet they don't always take the time to cross check information and consult multiple sources. Youngsters increasingly see things available online as free of ownership and cost, materials to be borrowed and re-purposed. Helping students acknowledge and rate sources is a step toward web-based productions and research. Encourage students to form their own views on what they stumble upon, based on personal research and exchanges with others and, most important, give them the time to be mindfully "add value" to what they find (Langer, 1997)

*What to share with whom, how, and why?* We all enjoy moments of privacy, times with friends, and moments of public appearance, and we like to have a say in who gets to know what about us. Today's kids mingle on-line with folks they may never meet, and use tools that spread their word beyond their circles of acquaintances. Device ways for kids to understand who is in the loop, who better stay out, and when it is best (or inappropriate) to

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<sup>14</sup>In 'a-synchronous' channels, like e-mail, only one of the communicating parties needs to be there at a time; the message is composed and sent at the writer's convenience, and read at the receivers'. This benefits anyone who needs to reflect before they write. Email is children's 'reflective' form of communicating. By contrast, in 'synchronous' channels, like phone, chat, and instant messaging interactions are in real time.

cross the divide between intimate, private, and public spheres. Find ways to keep track of *who's doing what* in shared endeavors, and teach kids to rank and establish online reputation.

*Taking the time / things well-done.* Today's students are used to the twitch-speed, multitasking, active, interconnected, and quick-payoff worlds of video games, MTV, and Internet. Let them navigate, but also, give them a chance to iterate, revisit, and refine. Give them occasions to dwell in and “geek out”. Many children like to build and program things. So, why not create ‘tinkering’ studios where youngsters can engage in long term-projects, build on each other’s ideas and, together, “polish” their creations. Support a found-art approach that combines high-tech and no-tech. Explore ways of repurposing, recycling. Cater the ‘bricoleur’ in today’s makers’ culture. Rethink what digital craftsmanship could be.

## 5. To conclude

There is more to growing up digital than to live one’s lives on line, and today’s natives are slowly but surely reclaiming their bodies and a sense of place. To respect the natives is to hear their latest new call (I put words in the natives’ mouths:): “Make me able to explore and show my creative skills locally, globally, anytime, anywhere but please don’t forget: I do have a body, and I like to use it! I’m exuberant! I’m physical: so, let me unleash my imagination (transport, teleport me) but also make me touch, feel, and move (ground me)”!

Today’s children, together with those in charge of their upbringing, are already making life-bearing adjustment to compensate for the unsettling consequences of both desired and imposed displacements. They seek new equilibrium and, to do so, they are inventing their own ways to sustain relational bonds beyond territorial borders, navigate under conditions of uncertainty, and remain securely attached.

Location-based and mobile technologies constitute one arena in which Baby-boomers, Gen-Xers and Digital natives alike can safely and playfully cross lines between physical and virtual, embodied and disembodied, located and remote. Do-it-yourself (DIY) and new craft movements are another. Each provides their own exciting ways to explore the shifting continuums between: agency vs. control, attachment vs. autonomy, gifting vs. trading, as well as issues of ethos, well-being, and equity, so central in defining who we are, how we relate to others, treat things, interact with place, and inhabit space.

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