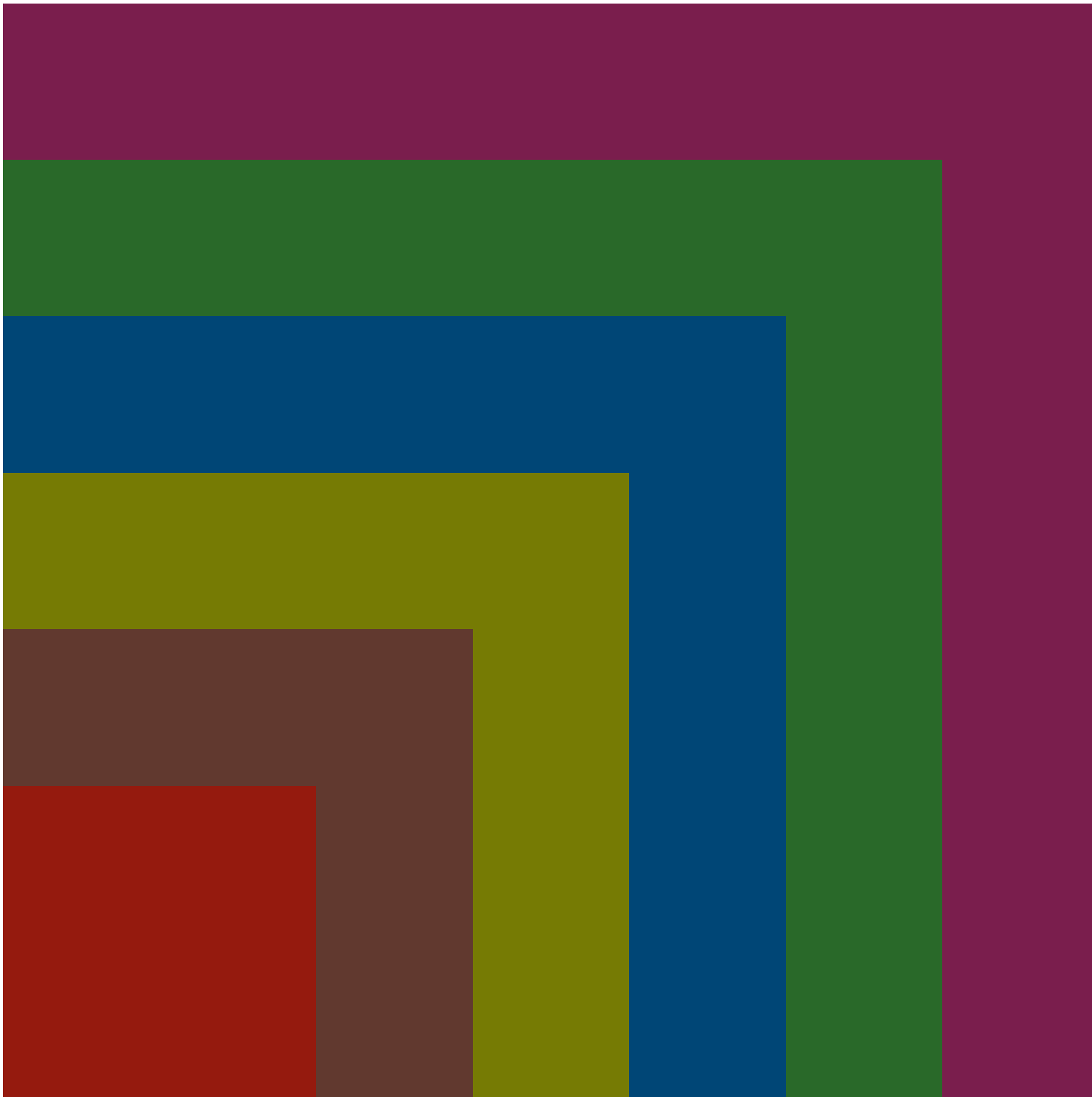2020 Forecast:
**Creating
the Future
of Learning**

2020 Forecast:
Creating the Future of Learning

A Radically Different World

This *2020 Forecast: Creating the Future of Learning* reveals how many of our fundamental relationships—with ourselves; within our organizations; and with systems, societies, and economies—are being re-imagined and re-created in ways that will disrupt the status quo and challenge our usual assumptions. The following pages will help you explore how these different dimensions of our world are changing and how we all can shape the future of learning.

To engage further in creating the future of learning, visit www.futureofed.org.

A Dilemma for Education

Over the next decade, the most vibrant innovations in education are likely to take place outside traditional institutions. These institutions face a critical dilemma: how to reconcile bottom-up developments in education with the traditional top-down hierarchy that is currently in place.

This 2020 Forecast illuminates how we are shifting toward a culture of creation in which each of us has the opportunity—and the responsibility—to make our collective future. We are seeing "educitizens" define their rights as learners and re-create the civic sphere. Networked artisans and ad hoc factories are democratizing manufacturing and catalyzing new local economies. These creators are highlighting the significance of cooperation and cross-cultural intelligence for citizenship and economic leadership.

Furthermore, advances in neuroscience are creating new notions of performance and cognition and are reshaping discussions of social justice in learning. Communities are beginning to re-create themselves as resilient systems that respond to challenges by replenishing their vital resources and creating flexible, open, and adaptive infrastructures.

Together, these forces are pushing us to create the future of learning as an ecosystem, in which we have yet to determine the role of educational institutions as we know them today.

Opportunities for Creating the Future of Learning

This *2020 Forecast: Creating the Future of Learning* is organized around six drivers of change, which are major forces of transformation that will shape our efforts to remake learning. These drivers of change, along with related trends and signals, appear on the inside of this forecast. You might find it helpful to take a look inside before considering these overall implications for the future of learning.

Looking across the drivers of change, the 2020 Forecast highlights the need for "schools" and centers of learning to be life-affirming organizations—for learners, their families, educators, and the broader community. It also emphasizes the need for learning to be an ongoing process whereby we all become engaged citizens of a global society. Third, and perhaps most importantly, this forecast illuminates the vital need for everyone concerned about learning—not only education "insiders," but also the powerful innovators on the periphery—to get involved in actively creating the future of learning. Our ability to meet the social, economic, health, and climate challenges of the next several decades depends on our heeding these messages from the future.

Resilient School Communities

As the future unfolds, schools will emerge as critical sites for promoting health, environmental vitality, academic growth, student wellbeing, and connections across their communities. In the best case, they will become focal points for interventions focused not only on educating resilient students, but also on promoting resilience in their communities. Schools will become dynamic, community-wide systems and networks that have the capacity to replenish themselves in the context of change.

Creating resilient school communities will require educators, families, and other citizens to develop new capacities. We will need to deepen both our networking power and our ability to use interactive media to form groups and catalyze action. In so doing, we will need to encourage "distributed innovation" that extends beyond the boundaries of any one organization or community, and will need to create platforms for collaborating and applying the "collective intelligence" of many individuals to form our resilience strategies. Finally, educators, families, and other citizens will need to be transparent about the impacts of social, economic, and biological stresses on our communities.

Amplified Educators and Learners

By embracing technologies of cooperation, prototyping new models of learning, and cultivating open and collaborative approaches to leadership, "amplified" educators and learners will become the organizational "superheroes" of schools and districts. Their approaches will challenge institutional hierarchies and policies but will also provide the exemplars of, and provocations for, innovation. Watch for signs of amplification outside and at the edges of the formal system—in such places as home school networks, independent schools, after-school programs, and community-based learning programs.

A Global Learning Economy

Geographic and digital migrations will facilitate the global movement of families, identity, values, educational resources, social capital, and innovations, thereby contributing to an increasingly global learning economy. As such migrations become routine features of modern life, they will drive diverse new demands for rights to, and resources for, learning. The creation and exchange of learning resources, environments, and experiences will form a global learning ecosystem, with families developing personal learning ecologies that span national boundaries. The globalization of open learning systems characterized by cooperative resource creation, evaluation, and sharing will change how educational institutions view their roles and will offer new forms of value in the global learning ecosystem. Education institutions will no longer be exclusive agents of coordination, service provision, quality assurance, performance assessment, or support. In fact, other players might be more equipped to provide these functions in the distributed ecosystem.

Opportunities for Creating the Future of Learning

Design as Philosophy

New tools and approaches to designing learning experiences will deepen our capacity to personalize learning. Data about preferences and interactions, as well as collaboration trails (such as records of where learners travel on the Internet and how they contribute to group activities and interact with others), will create new streams of information about learners' experiences and performance. Visualization tools will provide new ways of seeing data and of developing insight into learner support. In addition, neurological advances will help us make connections between specific physical and virtual environments and their impacts on cognition and brain health. The result will be an emerging toolset for designing personalized, learner-centered experiences and environments that reflect the differentiation among learners instead of forcing compliance to an average learning style and level of performance. At the community level, maker economies will elevate design as a practical problem-solving capacity that applies across community issues and helps empower local resilience.

Contested Authorities

As the hierarchical structure of education splinters, traditional top-down movements of authority, knowledge, and power will unravel. Before new patterns get established, it will seem as if a host of new species has been introduced into the learning ecosystem. Authority will be a hotly contested resource, and there will be the potential for conflict and distrust.

With measurement strategies and metrics producing mountains of information, we will need to decide what data are important, what they mean, and how we can act upon them. We will also need to explore how we can fairly evaluate performance when we are altering our minds and bodies through environmental hazards and physical experiments. Standardized testing is already surrounded by controversy, but new metrics and measurements will emerge from a variety of places outside education.

It remains to be seen whether new learning agents and traditionally certified teachers will cooperate or compete. While we can expect third-party learning agent certification to emerge, in many cases, the absence of regulation will mean that self-monitoring and reciprocal accountability will be the best methods for ensuring quality.

Diversifying Learning Geographies: Deserts and Oases

As learning resources proliferate in neighborhoods and cities around the world, communities will become the world's classrooms. Learning geographies will diversify as some communities become learning deserts barren of learning resources, while others become oases teeming with dynamic learning ecosystems. These learning ecosystems will make use of social and reputation capital, which will help communities build trust and locate resources; frameworks for cooperation, which will create incentives for participating in the collective generation of resources and for coordinating learning exchanges; and mechanisms for making learning visible, such as e-mail lists, websites, and sophisticated visual maps of resources.

Learning geographies will be accessible to communities through a range of key tools, such as data aggregated from disparate sources, geo-coded data linking learning resources and educational information to specific community locations, and visualization tools that help communicate such information in easily understood visual and graphic forms. Such information will often contain multiple layers of data (for example, school performance statistics, poverty rates, and the degree of access to fresh food).

These new dimensions of learning geographies will require new core skills. Among them will be navigating new visual cartographies, identifying learning resources in previously unexpected places, leveraging networks to take advantage of learning opportunities, and creating flexible educational infrastructures that can make use of dispersed community resources. Through enhanced visibility and accessibility, learning geographies will bring new transparency to issues of equity in learning.

Exploring Further

This 2020 Forecast outlines key forces of change that will shape the landscape of learning over the next decade. Its goal is to help everyone with a stake in learning identify shared interests, challenges, and strategies so that we can create transformative solutions for the future.

See www.futureofed.org for more information about these additional resources:

- **Group presentations**
- **Group workshops**
- **Scenario planning**
- **Youth voices workshop**
- **Policy briefs**
- **Tips for taking personal action**
- **Social network**

What role will you play in creating the future of learning?

EXPLORE THE FUTURE OF LEARNING AT
www.futureofed.org

2020 Forecast:
Creating the Future of Learning

This *2020 Forecast: Creating the Future of Learning* is the second future forecast created by KnowledgeWorks Foundation with the Institute for the Future. Our *2006-2016 Map of Future Forces Affecting Education* helped stakeholders with an interest in learning anticipate and prepare for change by highlighting the importance of participation in a world characterized by personal and collaborative media, smart networks, and the creation of value through grassroots economics. Join us in exploring how future forces are now pushing us to become even more active in creating a future that meets the needs of all learners.

About KnowledgeWorks Foundation

KnowledgeWorks Foundation (www.kwfdn.org) provides funding and leadership to promising and proven educational innovations throughout the United States. With a focus on transforming the US education landscape from a world of schooling to a world of learning, the foundation employs education experts and enlists innovative partners to equip our students to contribute to a global society hungry for talent and knowledge.

About the Institute for the Future

The Institute for the Future (www.iftf.org) is an independent, nonprofit research group with over forty years of forecasting experience. The core of IFTF's work is identifying emerging trends and discontinuities that will transform global society and the global marketplace. IFTF provides insights into business strategy, design process, innovation, and social dilemmas. The group's research spans a broad territory of deeply transformative trends, from health and health care to technology, the workplace, and human identity.

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⚙ Pattern Recognition

⚙ The Maker Economy

⚙ A New Civic Discourse

⚙ Platforms for Resilience

⚙ Amplified Organization

⚙ Altered Bodies

Experimenting at the intersection of environment and performance

Advances in neuroscience are revealing new understanding of the brain, its plasticity, and its responsiveness to the environment. Emerging notions of neuro-diversity and physical "disability" will challenge standards of what is "normal" and will spark innovations that help mainstream populations. At the same time, greater threats to human and environmental health from climate change, pollution, war, extreme urbanization, and other natural and human-made disasters will in the next decade create new stresses on minds and bodies. These stresses will converge in schools, some of which will seek to instill a sense of stewardship for self and environment in their students. With their mission to educate all students, these schools will become key sites for interventions to overcome the various challenges of disability and bio-distress and their impacts on learning.

Extended human capacity remakes the organization

Digital natives and technologies of cooperation are combining to create a generation of amplified individuals. These organizational "superheroes" will remake organizational models through their highly social, collective, improvisational practices and their augmented human capacities. These new models will thrive in a world of social networks; information proliferation, transparency, and saturation; and rapid change. As digital natives enter learning professions, and as existing educators and students become amplified, their extended human capacities will challenge traditional ways of organizing learning and will amplify schools, districts, and other learning organizations.

- **How will amplified educators and organizations change the role of school in the broader community?**
- **What will the relationships between schools that are amplified and those that are not be like?**

Creating flexibility and innovation amid system failures

System shocks and disruptions in the arenas of energy, finance, climate, and health care are key forces of destabilization in this century. Institutional strategies that focus on resisting disruption and maintaining the status quo will not offer sufficient responses. Platforms for resilience—enabling responsive flexibility, distributed collaboration, and transparency—will allow institutions to meet such challenges through innovation, adaptation, and openness. As key points of convergence for health, learning, and environment, school communities will need to develop strategies for building resilience into their systems and for creating lightweight, modular infrastructures that can support the health and well-being of learners, families, and learning agents.

- **What kinds of partnerships, transparency, and networks will be critical for building resilient school communities?**
- **What kinds of shocks might the education system face in the next decade?**

Rearticulating identity and community in a global society

The convergence of participatory media culture, diverse diasporic movements (the formation of dispersed populations that share common roots and identity), and frameworks for creating new commons (bottom-up means of managing shared resources) set the stage for re-articulating identity and community in a global society. Education will find itself a contested resource in the crossroads of these forces of change. It will become part of the civic discourse in multiple new kinds of public forums and spaces as "educitizens" make visible the status of schools and of educational decision-making, resources, and activities in their communities. School administrators, district-level staff, and teachers will need to learn how to communicate and interact in a bottom-up world of engaged educitizens.

- **What kinds of roles can educators and schools play in an increasingly transparent world with more bottom-up monitoring of learning?**
- **What kinds of public, visible dialogues should educators be catalyzing?**

Personal fabrication technologies and open-source principles democratize production and design

New forms of bottom-up social networking and economic coordination, along with advances in small-scale, community-based fabrication and design, transform local economies in the next decade, enabling productive flexibility that will help cushion against economic instability. New tools, including 3D printers (desktop printers that print out objects, parts, and components), computer-controlled machine tools (such as laser cutters), and online networking applications (that allow designers, consumers, tinkerers, and artisans to share blueprints, solutions, and how-to knowledge) will enable local communities to "make" their own economic futures—to innovate, customize, design, and create solutions to meet local needs. Schools, community centers, and local businesses will become important hubs of design knowledge, rapid prototyping, and problem-solving skills that will increase local interdependencies and resilience, redefining relationships with the broader economy.

- **What new skills are required for the maker economy, and what industrial and knowledge economy skills remain important?**
- **What new models of education suggested by the maker economy transcend industrial-age, assembly-line models?**

An extremely visible world demands new sensemaking

Information proliferation will continue, exacerbating the burden on families, learners, educators, and decision-makers to make sense of vast amounts of data. New tools for visualizing data will require new skills in discerning meaningful patterns. Social media and collaborative tools will leave "data trails" of people's online interactions—including contributions to group activities, inquiries and searches, skills, digital resources, and preferences (such as playlists, buddy lists, and topics tracked)—and social networks. At the same time, sensors and global positioning systems in devices such as cell phones and car navigation systems will be able to capture location-based information along with health and environmental data. Together these tools will provide a robust, visible "data picture" of our lives as citizens, workers, and learners. Families, learners, educators, and decision-makers will need to become sophisticated at pattern recognition in order to create effective and differentiated learning experiences and environments. Furthermore, new skills in collective sensemaking will redefine forms of knowledge, knowing, and assessment.

- **How do ubiquitous, visible data impact teaching, learning, and the assessment of learning experiences?**
- **How can we use data to enhance human decisions rather than automate them?**

DRIVERS OF CHANGE

2020 Forecast Key
Each area of this forecast contains three main components:

Drivers of Change are major forces of transformation that will shape our efforts to remake learning. They represent the convergence of several trends into emerging ideas and phenomena that will disrupt traditional narratives and assumptions about learning. The questions under each driver of change serve as useful starting points for discussion.

Trends are distinct directions of change that point to new concepts or new patterns of behavior that will shape the future of learning.

Signals are examples, or early indicators, of the changes described by the trends and by the drivers of change. By providing analogies, data, and explicit stories, signals help make the future seem more concrete.

Learning Agents
New agents of learning will help shape the future of learning by contributing to the expansion and redefinition of the education profession and its relationships to, and roles in, community life.

Learning Partner
Students who test for compatible personalities but who have different cognitive strengths will be matched to support each other throughout the year, maintaining a constant thread amid shifting peer relationships.

Personal Education Advisor
Assigned by certified local education agencies (such as schools, resource centers, and libraries) or selected and contracted by families, personal education advisors will help families create, nurture, and maintain personal learning ecologies.

Learning Fitness Instructor
Learning fitness instructors will help learners build and strengthen the basic cognitive, emotional, and social abilities essential to learning by using simulations, biofeedback, and hands-on activities to reduce stress, hone mental capabilities, and learn brain-friendly nutrition.

Edu-vator

to overcome the various challenges of disability and bio-distress and their impacts on learning.

- **How can experimenting and designing for "special" learners create innovations for all?**
- **How can school communities become centers for protection and rejuvenation in a bio-distressed world?**

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TRENDS

BIO-DISTRESS
Threats to our biological, ecological, and built environments drain resources and demand coordinated responses:

- Climate change
- Chronic illness
- Food insecurity
- Toxic materials
- Urbanization
- Pandemics
- Pollution

COGNITIVE MODIFICATION
The brain becomes a site for alteration and maintenance

ENABLED INNOVATION
Neurodiversity, physical enhancements, and disability communities converge, turning marginalized populations into mainstream innovators

ECO-SCHOOLS
Eco-schools become a nexus for health, environment, community, and learning

SIGNALS

SHARP BRAINS
Brain fitness, training, and exercise, www.sharpbrains.com

PROVIGIL
Medication to improve wakefulness has powerful off-label uses, www.provigil.com

OSCAR PISTORIUS
World-class sprinter Oscar Pistorius redefined athletic "disabilities," http://en.wikipedia.org/wiki/Oscar_Pistorius

CENTER FOR ECOLITERACY
Education for sustainable living, www.ecoliteracy.org

GREEN SCHOOLS INITIATIVE
Ecological sustainability and health in K-12 schools, www.greenschools.net

TRENDS

TRANSLITERACY
Effective communication requires reading, writing, and interacting across multiple media and social platforms:

- Broadcast
- Virtual worlds
- Wikis
- Digital video
- Microblogs
- Pandemics
- Social networking
- Tagging

OPEN LEADERSHIP AND SOCIABILITY
Open collaborative platforms enable networked teams to self-organize and support ad hoc leaders

BETA BUILDING
Transparency, collaboration, and rapid iteration create a beta culture displaying open critique and reflective practice

COLLECTIVE SENSEMAKING
Diverse and abundant data streams increase the need for organizations to tap collective intelligence

SIGNALS

THE INSTITUTE OF CREATIVE TECHNOLOGIES
Pioneering research on transliteracy, www.ioct.dmu.ac.uk

TEACHERTUBE
Instructional videos online, www.teachertube.com

PLAZES
Ad hoc collaboration through microblogs, www.plazes.com

MOODLE
An open-source course management system, www.moodle.org

FLAT CLASSROOMS
Web 2.0 amplifies the flat classroom, www.flatclassroomproject.wikispaces.com

DIGG
Platform for collective input on what is hot on the Internet, www.digg.com

TRENDS

SMART LOCALISM
Smart networking, data transparency, and bottom-up monitoring enable responsive, open decision-making

LEARNING GRIDS
Smart-networked resource providers and learning agents create lightweight, modular learning infrastructures

AUTOIMMUNE RESPONSES
Brittle hierarchies continue to act in ways that seem institutionally rational but which further destabilize weak, inflexible systems

SHADOW "SCHOOLS"
Super-empowered, networked learning agents leverage the growing learning economy to enable provisional learning systems

SIGNALS

TRANSITION TOWNS
Community wikis for adaptive strategies, www.transitiontowns.org

THE OPEN UNIVERSITY
The UK's open-entry, distance learning university, www.open.ac.uk

NO CHILD LEFT BEHIND
NCLB highly controversial among educators, www.ed.gov/nclb/landing.jhtml

AFTER SCHOOL FUNDING
Funding increases in California, www.afterschoolnetwork.org

HOLE-IN-THE-WALL EDUCATION, LTD.
Hole-in-the-Wall Learning Stations provide unrestricted computer access, www.hole-in-the-wall.com

HERE COMES EVERYBODY
Professor Clay Shirky writes about how Web 2.0 is revolutionizing the social order, www.herecomeseverybody.org

TRENDS

NEW CIVIC LITERACIES
Participatory media and digital natives bring transparency and collective action to the civic sphere

LEARNING COMMONS
Educational stakeholders grow collective learning resources, creating an alternative to public and private

DIASPORAS AS NEW MARKETS
Diverse movements of people create new identities and flows of learners

PERSONAL LEARNING ECOLOGIES
Families look outside the traditional "system" to create ecologies of learning experiences

EDUCITIZENS
Students and families affiliate around educational needs and claim rights as learners

SIGNALS

FUTUREMELBOURNE
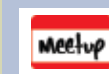The city plan that anyone can edit, www.futuremelbourne.com.au/wiki/view/FMPlan/WebHome

DC VOICE
Community school audits help manage the learning commons, www.dcvoice.org

HURRICANE KATRINA SURVIVORS
3.2 million citizens' homes destroyed

MEETUP FOR YOUTH RIGHTS
Using Meetup to discuss youth rights, www.nyra.meetup.com

ech

Self

Organizations

Systems

Society

PERSONAL FABRICATION AND DESIGN
Better desktop tools, 3D printers, and digital machinery democratize the machine shop

LIGHTWEIGHT COMMUNITY-BASED MANUFACTURING
Ad hoc factories and job shops enable flexible, fast, and customized production, unlike fabrication by assembly lines and dedicated factories

NETWORKED ARTISANS
Solo inventors, tinkerers, and craftsmen form networks to collaborate and celebrate their creations

CITIZEN R&D
Makers reach out to their markets and communities to ideate, iterate, and solicit feedback

(•) SIGNALS

PONOKO
Share, sell, and fabricate your designs, www.ponoko.com

TECHSHOP
Open-access, public workshop, www.techshop.ws

3D PRINTER
Print three-dimensional objects, www.fabathome.org

MIT'S FAB LAB
Get access to modern means for invention, www.ssbxfab.org/about

INSTRUCTABLES
Post your own how-to guide, www.instructables.com

THE OPEN PROSTHETICS PROJECT
Affordable prosthetics through open design and production, www.openprosthetics.org

Economy

↗ TRENDS

PERSONAL METRICS
Personal data trails about preferences, attributes, and performance shape an evidence-based culture

VISUAL LITERACY
Vast data streams require visual tools to discern underlying stories

OPEN-SOURCE ASSESSMENT
Data trails, participatory media, and visual tools create new bases for reputation, mastery, and recognition

GAMES AS PRACTICE
Gaming platforms become critical training areas for work, problem-solving, and learning

METAVERSE
Blended digital-physical realities create new learning geographies

(•) SIGNALS

THE QUANTIFIED SELF
Blog tracking personal sensors and metrics, www.kk.org/quantifiedself

GAPMINDER
Making statistics beautiful, www.gapminder.org

RATE MY TEACHERS
Students and parents rate teachers and schools, www.ratemyteachers.com

WORLD WITHOUT OIL
Massively multiplayer alternate reality game, www.worldwithoutoil.org

METAVERSE ROADMAP
Pathways to the 3D Web, www.metaverseroadmap.org

Knowledge

Edu-vator
Edu-vators will build platform prototypes, experiment with new tools, evaluate new practices, and generally explore innovations in the learning sphere. They will team with learners, who will get credit for being in "edu-vation workshops."

Community Intelligence Cartographer
Community intelligence cartographers will tap the collective intelligence of their local communities. They will leverage social networking strategies to develop swarms and smart mobs in order to identify emerging learning opportunities in the community, organize community members, and locate community resources.

Assessment Designer
Using social networks and insights into cognitive functioning, assessment designers will create appropriate methods for evaluating media literacy, learning discovery journeys, and other innovative forms of instruction.

Social Capital Platform Developer
Social capital platform developers will link the social capital infrastructure to teaching and learning practices and outcomes. They will use tracking programs to provide an accounting of people's contributions to open education resources and collaborative processes.

Learning Journey Mentor
Learning journey mentors will work with personal education advisors, learning fitness instructors, community intelligence cartographers, and assessment designers to co-create and navigate learning itineraries with small groups of students.

Education Sousveyor
Education sousveyors will keep the learning process transparent and will stimulate public discussion around it. Through mechanisms such as blog posts, pictures, podcasts, and videos, they will keep learning on the forefront of stakeholders' minds.