# THE Journal of Media Literacy

## A SPECIAL REPORT

Sock Chase

Trash 4 Cash in West Virginia

Save the Animals

Rita's Restaurant Adventure

No Gang More Maze

It's A Jungle Out There!

Final Countdown

# GLOBALORİA™
## INVENT ▸ BUILD ▸ SHARE™

Are You Making the Right Decision?

Survivor

## Students Making Game Media for Literacy and Learning

Finding Mr. X

Space Adventures

# Learning to Learn

Cause & Effect: The Daniel Calwell Story

Punctuation Dawn

Learn The Bones

Guest Editor **Martin Rayala, Ph.D.**
in collaboration with

**Idit Harel Caperton, Ph.D.**
Founder of WorldWideWorkshop & Globaloria

Deceptive Cadence

The Adventures of Henry the Hedgehog

Tiger Savior

Power Supply

Fishie Friends!

The Ultimate Lunch Tray

Flood Escape
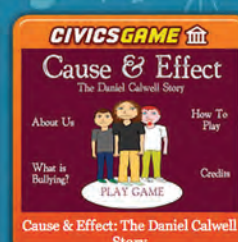
"From the time they are born, all kids learn by playing. In fact, many psychologists and educators say that game playing is what is missing from education today. *JML* is focusing this issue on the importance of integrating games into the classroom, and as a media educator, I couldn't agree more on their choice of topic. The key to teaching is engagement. If you capture students' attention, you can teach them anything. That is what playing and making games do: Engage students. Moreover, learning to produce educational games, in addition to playing them, can provide effective ways to teach a large variety of skills required by the Common Core State Standards. Globaloria programs do just that and more in multiple locations around the country. Student teams involved in creating games learn creativity, digital technology skills, collaboration skills, and media literacy skills. Why not make education fun, relevant, challenging, and effective? We need to have more curricula that involve media production, gaming, and hands-on constructive projects for *all* students in our nation."

*Esther Wojcicki* (@EstherWojcicki), Media Arts Teacher, Palo Alto High (Paly.net);
Founder, Palo Alto High School Journalism Program (Voice.Paly.net);
Vice Chair, Creative Commons (CreativeCommons.org); Chair, PBS Learning Matters, New York, NY;
Consultant, U.S. Dept. of Education, Washington, DC; Visionary, Google Teacher Academy, Mountain View, CA.

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"Students in our community who live on the downside of the digital divide benefit greatly from the blended learning approach that the innovative Globaloria learning platform delivers. Students at our school do Globaloria daily, as part of the curriculum, and it transforms the way they engage with digital media literacy and with core curriculum skills in science and mathematics. Globaloria brings STEM and Computing topics to life through game design, and our students and their parents are excited about this new approach to learning."

*Dr. Joe Gonzales,* Superintendent, East Austin College Prep Academy (EAPrep.org),
Southwest Key, Austin, TX (swkey.org | @SouthwestKey); First Hispanic Superintendent in Michigan;
Recipient, U.S. Department of Education John Stanford Heroes Award.

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"All students—regardless of zip codes or demographics—deserve deep and engaging experiences that provide opportunities to be media literate and successful in school, college, and a career. Although progress has been made, the nation's K–12 public schools still have a long way to go. The Alliance for Excellent Education applauds efforts that train teachers to make this critical shift into integrating technology and digital curricula. Such efforts are not easy. It is not about slapping a textbook on top of a laptop or tablet; instead, it's about transforming the learning experience to make it more personalized and engaging for every student, ensuring every student has the time to master the new way of learning through digital projects."

*Sara Hall,* Director, Digital Learning Policy, Alliance for Excellent Education, Washington, DC (All4Ed.org | @all4ed);
Former Deputy Director, State Educational Technology Directors Association, Glen Burnie, MD (SETDA.org).

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"Globaloria is an innovative digital literacy program with exciting potential for engaging girls and other underrepresented groups in learning to design and invent the technologies of the future, in addition to being savvy users of digital media technology. The program's alignment with CCSS and other educational technology standards such as CSTA, as well as its adaptability to a variety of in-school and out-of-school environments, make it a particularly powerful resource for improving computing and digital literacy education and engaging students in STEM and computing careers nationwide."

*Lucy Sanders,* CEO & Co-Founder, National Center for Women and Information Technology, Boulder, CO (NCWIT.org | @ncwit);
Former Member, Mathematical Sciences Research Institute Board of Trustees at the University of California at Berkeley;
Inductee, Women in Technology International Hall of Fame.

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"Entertainment software is one of the fastest growing industries in the U.S. economy. In 1996, it accounted for 74.1 million units sold and $2.6 billion in sales revenue. Thirteen years later, computer and video game companies sold 273.5 million units, leading to an astounding $10.5 billion in software revenue and $20 billion overall. Worldwide industry revenues exceed $55 billion. As a result, the entertainment software industry functions as a vital source of employment globally. Currently, video-game companies in the USA directly and indirectly employ more than 120,000 people in 34 states. All of which points to the fact that, from programmers and animators to designers, producers and writers, the video-game industry is an engine for well-paying creative-economy jobs. Globaloria is pioneering new ways to engage students in learning media literacy and mastering STEM knowledge, and at the same time, it is cultivating talent and preparing today's students for tomorrow's workforce. In other words, it's both an effective teaching tool and an economic-development vehicle—nationally and internationally. Policy makers, administrators, and education leaders must pay attention to Globaloria and programs like it, because they provide a gateway to a brighter future."

*Erik Huey,* Senior Vice President, Government Relations, Entertainment Software Association (TheESA.com | @RichatESA),
the U.S. trade association of video games publishers for video game consoles, wireless devices, PCs and Internet
(e.g., Nintendo, Sony, Microsoft, Disney Interactive, Konami, Ubisoft, Electronic Arts).

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### ABOUT THE JOURNAL OF MEDIA LITERACY

*The Journal of Media Literacy* (first published in 1953 as *Better Broadcasts News* and later as *Telemedium, The Journal of Media Literacy*) is published by the National Telemedia Council (NTC), the oldest ongoing media literacy education organization in the United States, having been founded in 1953. The editors invite special guest editors for particular issues of the Journal. *The Journal of Media Literacy* reflects the philosophy of NTC, which takes a positive, non-judgmental approach to media literacy education as an essential life skill for the 21st Century. The National Telemedia Council is an organization of diverse professionals interested in the field of media literacy education. NTC encourages free expression of views on all aspects of media literacy in order to encourage learning and increase growth of understanding of issues in Media Literacy. Any opinions expressed in *The Journal* or by individual members of NTC, therefore, do not necessarily represent policies or positions of the National Telemedia Council.

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# Globaloria

## STUDENTS MAKING GAME MEDIA FOR LITERACY AND LEARNING

## VOICES FROM THE FIELD

**STUDENTS AND EDUCATORS TELL THEIR LEARNING STORIES.**
SEE PAGE 64

1

# From the Editors

## GLOBALORIA SPECIAL REPORT

Welcome to this special report of *The Journal of Media Literacy*, a collaborative exploration by our organization, the National Telemedia Council, and the World Wide Workshop Foundation. As a special report, we diverge from our usual focus on a direct aspect of media literacy and look instead at an experiment in education. This is an outgrowth of our fundamental goal to work toward a media-wise, literate, global society. Seeking the bigger picture, we are exploring the relationship between media literacy and a new vision for the future of education. Where is education going? And what is the role of media literacy education in this picture?

The innovative experiment we report on, developed by Dr. Idit Harel Caperton and her World Wide Workshop team, provides an exciting example of how we can look to this bigger picture. We are delighted to partner with them. We come from different directions, but our visions converge. Fundamentally, we both believe in the value of empowering children to imagine, to create, to construct, to think, to learn.

Over the past decade, we have watched the evolution of Idit's thinking expand into valuable research and applications, from her work at the MIT Media Lab to MaMaMedia to the World Wide Workshop.* The latest of these innovations is Globaloria, the first and largest social learning network, where students develop digital media literacies, STEM knowledge, computational design, and programming through making games for learning and knowledge. In conversations with Idit, we realized that this multi-dimensional project deserved more space than one article could provide. We are deeply grateful that this report is underwritten by a grant from the World Wide Workshop and their grant-ors. Our editorial board found this to be an exciting opportunity, as well as a great challenge, as it is in the nature of our field to struggle with funding and advertising. Therefore, we are publishing this as a special report, rather than a regular issue to be transparent about this relationship.

As JML editors we identified Globaloria as an example of a well-designed, researched, and implemented experiment, going beyond the status of a simple classroom project and scaling into a model for major change. It was born as a visionary environment that is grounded in solid educational and developmental theories. It is supported by a committed community of educators, institutional leaders, businesses, and most of all, young learners in and out of school. These are the ingredients needed for bringing about major change that our 21st century culture demands.

We would like to express our appreciation for the innovative thinking that has created this report. Dr. Martin Rayala, as lead editor, and in partnership with Dr. Harel Caperton, helped conceive the vision of this collaboration, bringing together the varied ideas of the members of our editorial board and the coordinators of the Globaloria Project. Contributing authors Cristina Alvarez, Neil Andersen, Karen Ambrosh, Kate Vannoy, and Belinha De Abreu, together with Globaloria educators, provided key diverse perspectives. Paige Caulum, volunteer, sifted through the abundant information to highlight essential content and insight on this rapidly growing and evolving project that is Globaloria. We could not have captured the full richness of the work being done at Globaloria without the advice and support of Amber Oliver, Vice President of Partnerships and

Operations, Shannon Sullivan, Vice President of Programs and Production, and indeed, the World Wide Workshop team of experts. "Learning through Design" is a key ingredient to Globaloria, for this we thank Idit Harel Caperton, the visionary innovator whose research over the last three decades bridges learning theory with entrepreneurship, working tirelessly to transform education, making meaningful learning for a global citizenry of tomorrow. For these achievements, the National Telemedia Council has awarded her the Jessie McCanse Award for individual contribution to the field of media literacy.

As you peruse these pages, we invite you, our readers, to imagine the role of media literacy in effecting major change in education systems worldwide. The term media literacy is often misunderstood. Some programs in media literacy are about reforming media or protecting children from media; others are trying to adjust to—or better, to leverage the new media world through educational reform. What does the Globaloria experiment teach us? Where does it meet its ambitious goals? Where does it need additional thought? Does it lead to meaningful learning? Does it have all of the building blocks to lead to a media-wise, literate, global society? What's next for the next generation?

We invite you, our leaders, to think, learn, ask questions, and to join the conversation.

*Karen Ambrosh*
NTC PRESIDENT

*Marieli Rowe*
EDITOR &
EXECUTIVE DIRECTOR

## Media Literacy Recognized through
# THE JESSIE McCANSE AWARD

We were delighted to invite Dr. Idit Harel Caperton to be our guest co-editor with Dr. Martin Rayala. Founder and president of the World Wide Workshop and Globaloria, Idit is the recipient of NTC's cherished Jessie McCanse Award for Individual, Long-term Contribution to Media Literacy. Idit is an innovator who bridges research and entrepreneurship, helping children to construct their own learning through new media.

DR. IDIT HAREL CAPERTON

Through her unique blend of award-winning research, business acumen and leadership in spreading innovative new-media learning projects, Idit has become one of the most important driving forces in using new media technology for creative learning, innovation, and globalization through constructionist learning theory. Her projects have benefited children and youth around the world, providing access to Web 2.0 technologies and promoting learning through computing and game-making.

Throughout the 1980s and 1990s, Idit conducted breakthrough research at the MIT Media Lab that led to publishing the book *Constructionism* with Seymour Papert. Her book *Children Designers* received the 1991 Outstanding Book Award by the American Education Research Association (AERA).

Idit started the predecessor to Globaloria, MaMaMedia.com, in 1995. MaMaMedia is an example of a large and diverse application for playful learning with Internet technology. Pioneering kids' Internet media, MaMaMedia established global distribution and advertising partnerships and won numerous honors, including the Computerworld-Smithsonian Award (1999), the Internet industry's coveted Global Information Infrastructure Award (1999), and the 21st Century Achievement Award from the Computerworld Honors Program (2002). In 2002, Idit was

honored by the Network of Educators in Science and Technology and MIT for "devotion, innovation, and imagination in science and technology on behalf of children and youth around the world."

In 2004, Dr. Harel Caperton founded the World Wide Workshop to develop applications for learning with technology that combine game mechanics and social networking to empower youth to be inventors and leaders in the global knowledge economy. The Workshop launched Globaloria to fulfill this mission and to invent ways of using social networking and Web 2.0 tools to teach digital literacy to youth worldwide.

The Jessie McCanse Award for Individual Contribution to Media Literacy was presented to Idit in 2010 for over twenty years of visionary research, entrepreneurship, and innovative new-media learning projects that have collectively reformed our thinking about education and education reform.

## All about Idit from her colleagues and friends...

### ABOUT THE JESSIE MCCANSE AWARD

Jessie McCanse was co-founder of the National Telemedia Council (then the American Council for Better Broadcasts), a pioneering and life-long leader, mentor, and teacher. The Award, established in 1987, honors Mrs. McCanse for her steadfast dedication and leadership role in media literacy, her sixty years as leader of the organization with its positive philosophy, and as a champion of the highest standards of excellence, fairness, ethics, and innovation. •

### From Nicholas Negroponte
Founding Director, MIT Media Lab, and Author of Being Digital (1991)

Idit is one of the first three PhDs in constructionism from the MIT Media Lab and set a very high bar for others. She contributed with passion and intensity that has not been exceeded. Her theory of children as designers remains a benchmark and guides many of us today. In fact, I was with Idit in China at the time we all came up with the name One Laptop per Child. She remains very close to me personally and knows more about children and Media Literacy than anybody else.

### From Douglas Rushkoff
Author of Program or Be Programmed (2010)

Idit is a living laboratory. Her research is as grounded in praxis as her practice is inspired by theory. She does not merely test hypotheses but transcends them in her neverending quest to make interactive media experiences truly interactive.

Idit is one of the few people creating interactive media today who understands that the promotion of agency is not a default computer setting but an ethos that must be embedded into every stage of planning, development, and implementation. And that's why everyone who has the opportunity to interact with Idit herself, about pretty much anything, ends up utterly empowered for it.

### From Kathleen McCartney
Dean, Harvard Gradutate School of Education

There could be no more deserving recipient of the Jessie McCanse Award than Idit Harel Caperton. Idit has spent decades building and delivering curricula and learning initiatives for students from all backgrounds to develop critical thinking skills through technology. From MaMaMedia to the World Wide Workshop, Idit's approach to digital literacy has been innovative and successful. She is a leading educator whose work is closing the digital divide and equipping learners with 21st century skills. I am proud that she began her career in education as a graduate student here at the Harvard Graduate School of Education, and I am privileged to call her a friend and colleague.

# THE VISION:

## *Harnessing the Learning Potential of Social Networking and Game Design*

### By MARTIN RAYALA, Ph.D.

This Special Issue of *The Journal of Media Literacy* is unique in that it uses one case study (Globaloria) as a focal point for examining a couple of specific topics in media literacy education—social networking and game designing by students.

Both social networking and digital games are hot buttons in today's media ecology, culture, and education. Many schools refuse to deal with them at all or take great pains to insure that neither one plays any part in a student's time in school. Some schools include social networking and digital gaming as regular components of their instructional plan.

Globaloria uses social networks as learning environments, a context where students learn how to create their own games. They create their own games as means to learning important content, including computing literacy. Globaloria is premised on the idea that social networking and game design can both be positive tools in enhancing student learning.

### LIMITING ACCESS TO MEDIA

Not everyone agrees that the effects of social networking and video games are positive. Much of what passes for Media Literacy is basically extended arguments voicing distaste for contemporary media. The popular discussion about social networking and digital games often focuses mainly on their presumed negative impacts. Some people feel students already spend too much time immersed in these digital activities and that there is no place for doing even more at school. These people spend most of their energy trying to keep students from using social networks or playing games.

Nicholas Carr voiced these kinds of concerns in an article for the *Atlantic Monthly* in 2008 called "Is Google Making Us Stupid?" which he elaborated on in a book entitled *The Shallows: What the internet is doing to our brains.* Carr says the Internet leads us from one text, image, or video to another and we are bombarded by messages, alerts, and feeds. He argues that this pattern of interruption and distraction impedes the sort of comprehension and retention we get from "deep reading" (books). He wonders what the consequences are of new habits of mind that replace the sustained immersion and concentration

**MARTIN RAYALA, Ph.D.**
has been an assistant professor at Kutztown University of Pennsylvania. He is the Executive Director of International Design Education Alliance Schools (IDEAS) and the former State Supervisor for Art, Media, and Design Education at the Wisconsin Department of Public Instruction.

A past president of the National Telemedia Council, he is an editor for *The Journal of Media Literacy.* He is also the editor of the online magazine **andDESIGN** at http://andDESIGNmagazine.blogspot.com. Martin can be reached at anddesignmagazine@gmail.com.
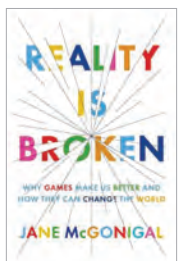
of reading a book with "darting about, snagging bits of information from the Internet."

## INCREASING ACCESS TO MEDIA

In contrast to this popular and comforting call for slowing down and shutting down our technologies, there is a growing countervailing argument that social networking, game-playing, and other popular media are essential to the growth and development of human intelligence. People like Jane McGonigal, who directs game R&D at the Institute for the Future, say that in the best-designed games, our human experience is optimized: "We have important work to do, we're surrounded by potential collaborators, and we learn quickly and in a low-risk environment." In her recent book, *Reality Is Broken: Why games make us happy and how they can change the world,* and in a presentation at a TED conference, McGonigal says that to save the world we need to play *more* games. In her work as a game designer, she creates games that can improve the way we learn, work, solve problems, and lead our real lives.

## IMPROVING THE QUALITY OF MEDIA

In addition to people who believe we should have less media and people who believe we should have more media, a third approach is voiced by people who believe we should produce *better* media. James Paul Gee's book, *What Video Games Have to Teach Us About Learning and Literacy,* forces educators, parents, and policy makers to question their assumptions about

games by using a game-player's (gamer's) understanding of what is engaging about games as tools for learning. Gee looks seriously at the good that can come from playing video games. He evaluates games like *World of WarCraft* and *Half Life 2* using theories of cognitive development to see how educators could produce "virtuous games" to enhance learning. Gee looks at major cognitive activities including how individuals develop a sense of identity, how we grasp meaning, how we evaluate and follow a command, pick a role model, and perceive the world. He believes we can enhance learning by creating games that teach important content and concepts.

> **The Globaloria approach is to have students create their own educational games and simulations as ways to enhance learning about important key concepts and school content.**

## CRITICALLY ANALYZING MEDIA THROUGH CONSTRUCTION

The approach most often associated with Media Literacy is helping students become critically aware, media-wise users and makers of media. Students learn that all media are constructions. Media are assembled, selected, edited, and designed by someone so they are not neutral or complete representations of reality. The media representations construct our "reality." They seem real to us and shape our beliefs—sometimes incorrectly or incompletely.

Students learn that they negotiate their own meanings when they view, use, or create media. Our own filters, beliefs, and values cause us to experience media differently from others with different backgrounds. Media messages contain values and ideologies of their creators that are conveyed through

themes, messages, plots, and narratives. These messages have social and political consequences. Media messages about sex, values, health, consumerism, social status, equality, etc. influence behaviors. Often these behaviors are intentionally shaped for commercial purposes so students need to be aware of times in which they are being manipulated to buy something under the guise of entertainment.

Media users who are also media makers can learn that each medium has a different structural and aesthetic form. Video games are different from television and film. The use of color, format, point-of-view, setting, lighting, music, sound, etc. influence our perceptions, often in ways of which we aren't aware. Makers of media must be conscious of the power of media and the moral and ethical implications of that power. To quote from "Spiderman," "With great power comes great responsibility."

## LEARNING BY CREATING MEDIA

So, finally, we get to a fifth approach—the approach promoted by Globaloria—and the focus of this issue of the Journal of Media Literacy. Rather than limiting students' access to media or producing more "serious" media, the Globaloria approach is to have students create their own educational games and simulations as ways to enhance learning about important key concepts and school content. But students also learn how to play good games: the more you read the better you write and vice versa.

Douglas Rushkoff argues for the importance of knowing how media actually work in order to fully understand them in his recent book, *Program or Be Programmed*. Our media awareness depends to some extent on whether we direct technology or let ourselves be directed by technology and those who create it. If we know how to create media or at least know how it works, Rushkoff argues, we gain control of our lives. If we don't understand how media are created, it could be the last real choice we get to make. Rush-

koff presents ten succinct commands for choosing our own destiny in the online era, ranging from *Do Not Be Always On* to *Do Not Sell Your Friends*. He presents ways in which we can actively leverage technologies to build a more connected world as opposed to allowing the technologies and those who create them to define the social constructs of our lives.

## CONSTRUCTING MEANING



This learning-by-doing approach, especially by integrating computational media tools and computer programming, has a long lineage in education and the theory behind it comes from a deeper approach to learning referred to as "Constructionism." Constructionism is the idea that learning can happen most effectively when people are actively engaged in making tangible objects in the real world.

Idit Harel Caperton, who founded the World Wide Workshop and Globaloria, was an MIT student of Seymour Papert, who developed the Constructionist approach in his work with technology and education. Papert created the epistemology and the Learning Research Group at the MIT Media Lab. There he developed the original and highly influential theory of learning called "Constructionism," built upon the Constructivist learning theory of Swiss psychologist Jean Piaget. (Note



**SEYMOUR PAPERT**

the distinction between *Constructivist,* a learning theory developed by Piaget, and *Constructionist,* a teaching methodology developed by Papert to include learners' social construction of knowledge.)



**JEAN PIAGET**

Papert worked with Jean Piaget during the 1960s and is
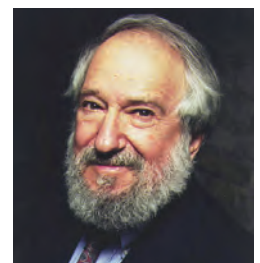
considered by some to be the most brilliant and successful of Piaget's protégés. Piaget once said, "No one understands my ideas as well as Papert." From Piaget's Constructivist theories of psychology Papert developed a view of learning as a *reconstruction* rather than as a transmission of knowledge. He promoted the idea that learning is most effective when it is part of an activity the learner experiences while constructing a meaningful product. But Papert added two essential elements: computational tools and social context for learning.
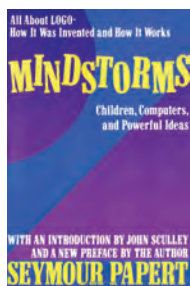
Papert's ideas became well-known through the publication of his book *Mindstorms: Children, Computers, and Powerful Ideas* in 1980. He described children creating programs in a programming language he developed for very young learners called Logo. His idea was to have students learn programming by getting a small robot (a Turtle) to draw shapes by following the commands students typed in. He likened this approach to learning, to living in a "mathland," where learning mathematical ideas is as natural as learning French while living in France. Today we would refer to this as "immersive learning."

In Constructionist learning, students draw their own conclusions through creative experimentation and the making of objects (and knowledge). The Constructionist teacher takes on a mediational role (the guide on the side) rather than adopting an instructionist position (the sage on the stage). Teaching "at" students is replaced by helping them understand—and helping each other understand—problems in a hands-on way.

In the field of media literacy, students often engage with media theory (critical analysis) and media production simultaneously. Constructionist learning is put into practice by the Workshop and Globaloria project. With Papert as a Founding Advisor, the foundation established the Globaloria learning platform in 2006 to teach youth to become game and simulation makers using Constructionist learning principles. Dr. Harel Caperton and Prof. Papert envisioned multiple social learning networks for learning content—mathematics, science, art, music—through the design of games media that illuminated that content within a social network of peer-to-peer learning in a global context.

In the past, Constructivist ideas were not uniformly accepted because some felt that children's play was aimless and of little importance. Piaget and those who followed see play as an important and necessary part of the student's cognitive development and have provided scientific evidence to support the ideas.

## EXPERIENTIAL LEARNING

Experiential learning is a related concept behind the Constructionist approach. Educator and philosopher John Dewey was the most famous proponent of experiential education. His curriculum theory promoted the need to have experience as central in the educational process.

**JOHN DEWEY**

Dewey advocated that education be based upon the quality of experience. For an experience to be educational, Dewey believed that certain parameters had to be met, the most important of which is that the experience should have continuity and interaction. Continuity is the idea that the experience comes from and leads to other experiences, in essence propelling the person to learn more. Interaction is when the experience meets the internal needs or goals of a person. Dewey also categorizes experiences as possibly being mis-educative and non-educative. A mis-educative experience is one that stops or distorts growth for future experiences. A non-educative experience is one in which a person has not done any reflection and so has not attained lasting mental growth.

In experiential education, students are able to find their own voices through peer-to-peer interaction. Students are seen as active participants in the learning process. Students are given the opportunity to apply their knowledge and skills by making connections to

the real world. Therefore, effective learning entails active experimentation with a hands-on approach to learning. Students learn more by being active and interdependent in establishing group goals and decision-making skills. As a result, students are also capable of developing leadership skills, which can also enhance student motivation and confidence.

Nicholas Negroponte is the father of formalizing learning about digital media and its transformative power. With Papert he created the first graduate program for interdisciplinary, experiential education in digital media innovation at his Media Lab in the mid 80s.

In 2005, Negroponte founded One Laptop per Child (OLPC), a non-profit for inventing low-cost laptops with built-in programming languages for kids. OLPC is another powerful example for experiential self-learning. Today, 2.5 million XOs are in the hand of kids in 40 countries, with 25 languages in use. In Uruguay, for example, 400,000 kids have XO laptops, and knowing how to program is required in schools. The same in Estonia. In Ethiopia, 5,000 kids learn to read and write computer programs. His goal has always been "to facilitate kids learning by themselves."

**NICHOLAS NEGROPONTE**

## SOCIAL NETWORKING

A form of Constructivist learning called Social Constructivism views each learner as a distinct individual with unique needs and backgrounds. The learner is also seen as complex and multidimensional. This approach includes the background, culture, and worldview of the learner. It also stresses the importance of the learner's social interaction with other children, adults, and the physical world. The responsibility for learning depends increasingly on the learner and emphasizes the importance of the learner being actively involved in the learning process, unlike previous educational viewpoints where the responsibility rested with the instructor to teach and where the learner played a passive, receptive role.

The process of sharing individual perspectives is called *collaborative elaboration* and results in students constructing understanding together that wouldn't be possible alone. This leads to the idea that Social Networking, in which students communicate with each other digitally, is a valuable way for students to construct meaning from what they are learning. Students with different skills and backgrounds collaborate through online discussions to arrive at shared understandings.

Collaboration among learners is in direct contradiction to traditional competitive approaches where students are discouraged from "passing notes in class." What was once thought of as "cheating" now becomes a requirement for collaborative learning. Collaborating and working as a team is now seen to be more productive than individual, isolated work. In fact, in her Ph.D. work at MIT, Dr. Harel Caperton had already explored social context for learning mathematics through software design, and this informed her future work with MaMaMedia and World Wide Workshop.

**DR. IDIT HAREL CAPERTON WAS THE FOUNDER OF MAMAMEDIA.COM, THE WORLD'S FIRST CONSTRUCTIONIST WEBSITE FOR KIDS TO CREATE MEDIA ON THE INTERNET.**

## THE BACKCHANNEL

The term "backchannel" refers to a growing practice of audience members communicating through social networks during presentations. To the uninitiated this

seems more like "backtalk" (an impudent or insolent retort or response) and they are often offended and outraged by such behavior. For the media savvy, this behavior is encouraged and, it is argued, is really a sign of active listening and truly engaging with the speaker.

Rather than tuning out while a presentation is being made, people are turning on laptops, iPads, and cell phones to send out text messages, not only to each other but to the world in general. This makes for a much richer and engaged learning experience.

In his book *The Backchannel: How Audiences are Using Twitter and Social Media and Changing Presentations Forever*, Cliff Atkinson explains how new forms of online communication are shifting the rules between audiences and presenters. Instead of sitting politely until it's time for Q & A, people are going online *during* presentations to add comments, resources, and opinions via an electronic backchannel.

Presenters who are aware of the constructive power of such multi-channel engagement often apologize if they are doing too much "lecturing" and not engaging the audience more. This also helps minimize overused PowerPoint presentations as the main way to communicate information. One measure of success then becomes how many talking points are posted and reposted online. Rather than a distraction, social networking becomes a vehicle to extend ideas to people outside the room, giving a larger virtual audience access to the presentation.

By creating an online site for a presentation prior to an event, a smart teacher or presenter can initiate a backchannel that involves the students or audience and gathers comments and suggestions before and during the talk or class. After the event, the site becomes an archive for evaluation responses, blog postings, reference material, and a transcript of the discussion. A presenter can also create instant polls using special applications designed for this purpose and then everyone can see what others are thinking on a topic in real time during the session.

The backchannel requires a change in attitude about how learning takes place. It requires confidence in constructionist teaching practices. It will feel uncomfortable to presenters who are attached to traditional ways of controlling audience participation and involvement, but it shows how social networking can magnify the impact of a learning experience.

## LET'S BEGIN!

So now, let's take a look at an actual application of constructionist learning practices that uses social networking to enhance learning for students. In the articles that follow, we get to find out what the Globaloria Program is and how it impacts student learning by applying some of the most robust learning theories and practices available. Read the articles in this issue, visit the Globaloria site, explore as if you were a student, and see the potential of social networking and game designing as tools for enhancing student motivation and learning. And have some fun along the way! •

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# WHAT IS GLOBALORIA?

## COMPILED BY PAIGE CAULUM

As a leading experiment on digital media and computing in education, Globaloria has become a model for developing STEM (Science, Technology, Engineering, and Mathematics) knowledge and global digital citizenship skills together in a unified curriculum. Through game design, thousands of students and educators have discovered new ways to learn and teach STEM and digital media skills.

Globaloria is a rigorous, turnkey instructional solution for STEM learning, comprising access to a safe online platform with a multi-year academic curriculum, game design and programming tutorials, game-content resources, and virtual support systems for educators and youth.

### HOW IT WORKS

Globaloria leverages the most cutting-edge technologies to offer schools a scalable and networked affordable solution. Globaloria.org consists of five interconnected platforms that support independent and collaborative learning and the information, research and data management needs of the program. The multi-year digital game-design curriculum is supported by a large library of online tutorials and resources and uses industry-standard tools and technology (Media-Wiki, GoogleTools, ActionScript) to prepare youth for academia and careers. Working independently and in small teams, students drive the design process, taking an original idea to a final game product.

Learning by doing, students create games and simulations on a particular social issue or educational content area (e.g., mathematics, science, civics, health, the environment, or other "big idea" topics) and in the process gain valuable information, digital and social networking literacy, livelihood skills, and awareness about the world as they investigate topics for their games.

Students participate in the *Globaloria Social Learning Network* to master content through computational inventiveness, learn to solve programming problems, and share computational knowledge publicly. Learning is enhanced with onsite collaboration with classmates and educators, as well as virtually with students in other schools and professional game makers and programmers.

GLOBALORIA STUDENTS IN TEXAS PROUDLY DISPLAYING THEIR ACHIEVEMENT OF EXCELLENCE IN DEVELOPING EDUCATIONAL GAMES – *THE GLOBEY GAME DESIGN AWARDS.* PRIZES FOR THE WINNING TEAMS INCLUDE SOFTWARE AND COMPUTERS. See page 43.
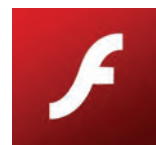
**Adobe Flash is the first development environment where students learn to become creators of game media.**

**Media Wiki is the authoring environment for posting progress and designs.**

**Blogger is used daily as a social tool for learning media literacy.**

## MAKING AN IMPACT

This results-proven and scalable program is empowering educators, creating community engagement and preparing students to succeed in college and the workforce. Since launching in 2006, Globaloria has now been implemented with 7,000 students and educators within 80 schools in seven states. Preliminary results show improved cognitive skills and increased achievement in math, science, and social studies.

Providing participants with both access and opportunity to develop digital literacy and STEM expertise ameliorates the effects of the digital divide on the minority, high-poverty populations served and prepares them to be the next generation of technologists, politicians, educators, community organizers, parents, and leaders.

The teaching model for Globaloria is driven by three key constructionist computational thinking abilities, or learning outcomes:

1   The ability to do invention, progression, completion of an original project; capability to program an educational game, wiki, or simulation.

2   The ability to manage project-based learning in Web 2.0 learning environments; capability to process complex project and team management (via programmable wiki systems).

3   The ability to produce original computational media; produce programming code, publish and distribute interactive, purposeful digital media in social learning networks.

Research shows increased academic performance, advanced digital literacy, and improved learning habits and behaviors for students participating in the Globaloria program. In addition, teachers in the Globaloria program believe they are better teachers as a result of the program and have transformed their teaching style to include more facilitated learning overall.

## EMPOWERING EDUCATORS

At the core of Globaloria is a deep and rigorous professional development service model that empowers educators with the skills and knowledge to lead a STEM-rich, blended classroom. Educators engage in multi-year, intensive in-person and virtual professional development, continuous self- and peer-to-peer learning, and mentoring; all of which empowers them to transform their teaching for collaborative, transparent, and hands-on learning. Educators join a dynamic virtual community where they engage and learn—using the same tools and curriculum and gaining the same digital and social networking skills as their students.

# Globaloria In action



TEAM MILKAPEDIA OF GEORGE WASHINGTON HIGH SCHOOL IN CHARLESTON, WV CREATED *CAUSE AND EFFECT*, A GAME INCORPORATING ORIGINAL VIDEO CONTENT AS IT TEACHES PLAYERS ABOUT BULLYING.
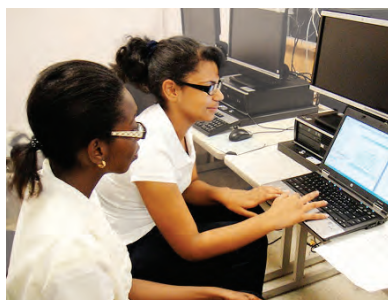


GIRLS ENROLL IN GLOBALORIA AT A HIGHER RATE THAN THE NATIONAL AVERAGE FOR STEM-FOCUSED PROGRAMS AND DEVELOP INCREASED INTEREST AND ENGAGEMENT IN STEM CAREERS AS A RESULT.



CREATED BY TEAM ROMAN NUMERALS (CALLAHAN BORONKAY, JOSHUA KWON AND VICTORIA EDWARDS) OF THE ADVENTURE STEM PROGRAM AT THE HERMAN INTERMEDIATE SCHOOL IN CALIFORNIA, PLAYERS OF THIS GAME EXPERIENCE THE JOURNEY OF A GLADIATOR IN ANCIENT ROME.
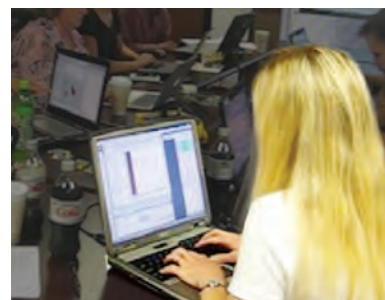


A KEY COMPONENT OF THE GLOBALORIA PROGRAM IS THE ONGOING PROFESSIONAL DEVELOPMENT AVAILABLE TO EDUCATORS AND LEADERS.

## MUSIC AND MEDIA LITERACY:





The National Jazz Museum in Harlem and the Workshop teamed up for an innovative youth program that blends music and digital literacy. Celebrated musician Jonathan Batiste led a series of Globaloria-Jazz Workshops, teaching youth to create videogames based on jazz.

Guided by the Workshop team of experts and the Globaloria digital curriculum, Batiste and his young mentees (ages 10-18) formed a game-design team. They worked together in daily creative sessions for 6 weeks, where they listened to and played jazz, and at the same time, they learned to imagine, design, and develop their ideas into a game with music and animations about the history of jazz in Harlem.

# ON SCHOOL REFORM:

# *The Do-It-Yourself Game Generation*

## By CRISTINA C. ALVAREZ, Ed.D.

As societies worldwide seek ways to prepare children to live and work in the 21st century, new models for youth learning are being considered that could not have been imagined a decade ago. One such model, Globaloria, uses game design to help kids learn better by becoming Do-It-Yourself (DIY) game designers. DIY is a term used to describe making something on one's own, with the minimal aid of experts and professionals.

DIY game design refers to students developing their own on-line video games, from the entire pre-production stage of a game's content and rules through final production, where they flesh out the storyline, characters, visual environments, and programming. The games can be designed for any number of purposes: to learn a new skill, to create social change, or for pure entertainment. In the process of making their own games, the kids become better learners.

When game design took off as a new popular science in the early 1990s, game developers were cadres of

**Globaloria is a social learning network where students learn as much from each other as they do from adult teachers, mentors, and industry experts.**

young male adult techno-geeks. Teens and children were video game consumers. They were the audience. Today, kids are increasingly becoming game producers.

Games are more popular than ever. Across the globe, people spend "3 billion hours a week playing computer and video games" (McGonigal, 2010). The wild popularity of electronic games, which outdoes "all other media put together, including movies, TV, print and the Internet" (Nunberg, 2011; Gleick, 2011) combined with research about the "cognitive benefits of game play," have opened possibilities for game-design markets to flourish and for game-design by kids to be seen as a viable learning activity.

### GAME-BASED LEARNING IN SCHOOLS

Since their inception in the 1980s, the use of digital games has systematically increased in schools. From the 1990s to the 2000s, schools offered off-line educational digital games as learning aids. In these early programs, kids practiced subjects with "single-player drill and practice games" (Johnson, Smith, Levine, & Haywood, 2010). Collaborative digital games followed where kids solved problems through discussion and small group work. As schools got wired to the Internet in the 2000s, game-based learning was delivered over the web, allowing for more interaction and connected learning activities. In their private lives, kids and young adults began to play massively multiplayer online (MMO) games in which gamers from all over the world play with or against each other in real time. This suggests that game-based learning will become increasingly

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more dynamic, natural, and interactive, and kids will take more of a central role in their learning.

## THE CASE FOR NEW DIGITAL LITERACIES

For some time, a persuasive case for transforming current methods and systems of K-12 education has been made by bipartisan task forces, consortia, advocacy organizations, and commissions asserting that K-12 schools are ill-equipped to prepare students for the rapidly changing world of commerce and information.

According to the Partnership for 21st Century Skills, today's children will live and work in "economies driven by innovation and knowledge; in marketplaces engaged in intense competition and constant renewal; in a world of tremendous opportunities and risk; in a society facing complex business; political, scientific, technological, health and environmental challenges; and in diverse workplaces and communities that hinge on collaborative relationships and social networking." (P21, 2007)

The North Central Regional Educational Laboratory says that in order for kids to be ready for the future, they should develop skills and dispositions in four categories: Digital-age Literacy, Inventive Thinking, Effective Communication, and High Productivity.

- **Digital-Age Literacy** includes basic, scientific, economic, and technological literacies; visual and information literacies; and multicultural literacy and global awareness.

- **Inventive Thinking** covers adaptability and managing complexity; self-direction; curiosity, creativity, and risk-taking; and higher order thinking and sound reasoning.

- **Effective Communication** encompasses teaming, collaboration, and interpersonal skills; personal, social, and civic responsibility; and interactive communication.

- **High Productivity** comprises prioritizing, planning and managing for results; effective use of real-world tools; and ability to produce relevant and high quality products. (NCREL, 2003)

Developing new literacies "rooted in Internet digital communication technologies and that are heavily dependent on socially constructed, collaborative and participatory learning activities" (Lankshear & Knobel, 2008) will be central to becoming a literate 21st cen-

tury citizen. New literacies are defined as knowledge and social practices such as blogging, instant messaging, chatting, social networking, digital visual imaging, and using mobile/wireless handheld devices such as cellular phones and global positioning systems. The game-design programs reviewed for this article push the limits of new literacies by having kids become developers and designers of their own games and of their learning.

## FOUR VIEWS ON MEDIA LITERACY AND GAME DESIGN

There are four approaches to the use or production of games in media literacy and each carries assumptions.

1 **Kick the Game Habit.** To some people technology is like Pandora's box and should be controlled to mitigate the social ills that they believe will follow (Richtel, 2010). According to this view, using new media technologies wastes time and causes people to be distracted, forgetful, and isolated. For evidence, they point to cases in which using technology enhances the negative effects of group behaviors. Some teens use social media for anti-social behaviors like cyber-bullying and flash mobbing. In a series of articles run in the NY Times on the negative effects of technology, particularly on the young, Michael Rich, Associate Professor at Harvard Medical School and Executive Director of the Center on Media and Child Health in Boston, notes' "Their brains are rewarded not for staying on task but for jumping to the next thing." In this view, kids who create their own games are not engaged in productive learning.

2 **Play Games with Passion!** The second approach proposed by Jane McGonigal, game designer and Director of Game Research and Development at the Institute of the Future, asserts that game playing leads to increased learning and that we should spend more time playing digital games. As kids play games and figure out how to use levels, they practice the thought processes of planning ahead and strategizing. They develop persistence, patience, and the ability to keep calm under intense pressure, to think logically, and to solve problems systemically. This approach is not so much about kids designing games as it is about interacting with popular commercially available games and applying play skills to improve the real world.

3 **Virtuous Games.** The third approach is supported by the work of prominent game researchers Henry Jenkins,

James Paul Gee, and Kurt Squire. They see technology and games as good influences on the young. They support the making of games that teach kids the facts and skills they need to be media literate. The games can be designed by adults for kids or can be created by kids for their own uses. In this point of view, the quality of a game is important because good games help us learn hard and challenging skills. Gee lists 36 learning principles based on theories of human learning and suggests that virtuous games are designed with many of these characteristics built into their architecture.

4 **Do-It-Yourself Games** The fourth approach originated in the work of MIT researchers led by Seymour Papert, Idit Harel Caperton, Uri Wilensky, Mitch Resnick, and Yasmin Kafai, who consider game and simulations design as a youth-empowerment model. Designing a game's architecture, mechanics, and coding it provide ways for kids to construct a deeper understanding of powerful ideas as well as to change the world. It is the MIT approach to education at all levels: Students should apply their thinking through design skills to solve the world's most urgent problems using engineering and computing.

The Globaloria program, an example of viewpoint #4, has students make "web-games about issues they care about" and in so doing encourages them to analyze their attitudes and beliefs about the world. In one activity they used a course blog to "review games and topics of interest to the community." In another instance, in 2008, the World Wide Workshop partnered with The ReThinkers, a youth organization in New Orleans to use the Globaloria learning process in a summer camp where kids ages 8-18 worked in a team to develop a game-based campaign for improving food in their school cafeterias and improving the lives of people who are living in their economically-disadvantaged community. In 2011, kids ages 10-18 worked with jazz musician Jonathan Batiste and his band *Stay Human* to develop a game about the history of jazz in Harlem. In so doing, the young game designers learn to see themselves as agents of positive social change and hone their media literacy skills.

**Students learning as game players and game designers demonstrate a dramatic rethinking of the role kids can have in their own learning.**

## GAME DESIGNERS AS AUTHORS

Globaloria (www.globaloria.org) is premised on the idea that social networking and game design are both positive tools to enhance student learning. Globaloria explicitly teaches kids skills through tutorials so that they can learn how to design their own games.

Globaloria is a learning community of peers and experts where kids learn as much from each other as they do from adult mentors. The Globaloria network's open community features harness the power of kids' collective creativity and their natural tendency to learn through social interaction. As members of the "Re-think Wiki community," the students follow guidelines for how to use the wiki to give and receive constructive feedback, share personal information, and be safe in the cyber-sphere. There is etiquette on how youth can modify the projects of others and give credit to other game designers in the social network.

The way the Globaloria platform and tools are organized illustrates how it supports learners as they work in the open collaborative format. Users can track the most recent changes on a wiki page, from the last 50 to the last 500 edits. Access to page history, which records the changes made by students, gives them the ability to see each other's thinking and creation process. Understanding is deepened because kids are learning with and from each other.

The architecture of the Globaloria platform is easy for teachers and kids to use. Kids and teachers alike will appreciate using Globaloria's "how to" steps and templates to guide them through the process of designing their own games. In a typical sequence, after the student designs her game she can use the Make Your Own Design Plan template to write a Game Pitch and present her ideas to classmates. She then posts drafts of her game to a wiki page for all of the members of the Globaloria community to review and comment on. The wiki

space is an online repository of ideas and an exhibition space for students to showcase their talent.

Globaloria also supports the school's existing curriculum, which is a valuable feature for public school administrators and teachers who are under federal accountability pressure to improve reading and math test scores. Globaloria's approach to learning with technology requires kids to read and write as they plan their work. This feature makes Globaloria an educational resource that teachers can use to boost reading, writing, and language arts content, making it easy to include the program during the literacy block of a regular school day.

## GAME DESIGNERS AS PROGRAMMERS

Globaloria is targeting middle-school, high-school and college-level students and believes in using most pervasive, professional programming and authoring tools such as MediaWiki, Adobe Flash Actionscript, Javascript, Unity, and Google tools. There are other programs that teach young students how to build their own games, such as Scratch, a beginner's programming language and community developed by Media Lab's Lifelong Kindergarten Group (www.scratch.mit.edu).

Scratch is often used in out-of-school programs for younger students, like the Computer Clubhouse Network, which operate afterschool and on weekends in over 100 under-served communities worldwide. Based on the success of the Computer Clubhouses, out-of-school computer game design clubs are springing up all over the United States. An example is the Game Maker Academy in Chicago that "teaches students how to make their own video games, simulations, animations, and digital stories" (www.gamemakeracademy.org).

Students practice computational and mathematical reasoning by using the Scratch drag-and-drop programming logic activity to make their characters move and make sounds. In the creative process of writing the game's action and scripts, kids learn to reason systematically. To add variety, kids can use stock characters and sounds or they can draw their own images and record their own voices. The Scratch website, http://scratch.mit.edu, like Globaloria, allows the young programmers to post their projects to the web so that the on-line community of Scratch users can view and learn from each other's creations.

## GAME DESIGNERS AS MEDIA ANALYSTS

Media literacy encourages young game designers to analyze media including the games they produce. As students design their own games they must be reminded that these are not neutral creations. A principle of media literacy is that all media express a point of view. Students must ask themselves, "What point of view does my game represent? Do I have an agenda of which I may not be aware? Who is my audience? Who is excluded from my audience? Does my game raise any issue or problem that I should consider?"

Students learning as game players <u>and</u> game designers demonstrate a dramatic rethinking of the role kids can have in their own learning. When students become authors of their own games they are empowered as learners and as thinkers. Game design by kids has the potential to reshape K-12 education. ●

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# THE THEORY:

# Toward a Theory of Game-Media Literacy:
## PLAYING AND BUILDING AS READING AND WRITING

*Idit Harel Caperton, Ph.D., World Wide Workshop Foundation, USA*

## GAME LITERACY

In order to understand and define game literacy, we must first ask a few big questions: What is the significance of gaming practices for cognitive development and learning? How can games be leveraged as an important component of digital literacy development?

My colleague James Paul Gee and I collaborated at this year's annual meeting of the American Educational Research Association, offering two gaming-based theoretical frameworks for learning and digital literacy. Although we are known to approach these topics ("gaming and learning" and "game literacy") from different perspectives, we attempted to integrate our views regarding 21st-century learners and their preferred learning environments in an effort to arrive at the same focal point.

During the session, we discussed a variety of ideas with examples from our most recent work. We hoped to inspire educational researchers, practitioners, policy makers, and funders to deepen their understanding of various "videogame practices," involving 1) commercially-available videogames as learning tools; 2) videogames that teach educational content; 3) games and sims that involve modding and design as a learning environment; 4) game-making systems like GameStar Mechanics, Game Maker, Scratch; and 5) widely-used professional software programming tools like Java or Flash ActionScript.

This AERA session was intended to be a field-building session—a step toward a much larger conversation about the meaning and value of various kinds of game practices and literacies. We sought to shed light on why today's students should become game-literate and to demonstrate a variety of possible routes that lead to game literacy. We also discussed the role of utilizing games and creating game-media in the learning and cognitive development of today's generation of students and educators.

## MULTIPLE TRADITIONS FOR INITIATING AND INTERPRETING GAMING PRACTICES FOR LEARNING

Game literacy is a multidimensional combination of varied practices (e.g., reading, writing, and calculating; textual, visual, and spatial cognition; interactive design, programming, and engineering; multitasking and system understanding; meaning making, storytelling, role playing, perspective taking, and exercising judgment; etc.). Different gaming practices form a whole that has roots in both traditional literacy theories and Constructionist digital literacy. Though seemingly disparate, both traditions attempt to develop methods for describing how players/learners learn and how they construct knowledge in gaming contexts.

Both traditions focus on the processes of learning rather than the product (winning the game or the actual game created by a learner/designer). Both traditions struggle with the difficulties of capturing the process of learning (an intersection of individual, context and activity over time within a situated perspective) as a unit of analysis. Despite the challenges that persist in such a dynamic and distributed object of study, educators and researchers continue to explore and refine innovative methodological approaches that capture and track learning as it flourishes within the rich environments of various gaming practices so as to inform instructional

practice and design (also known as design-based research, e.g., Brown, 1996; Dede, 2005).

## RESEARCH INTO PLAYING VIDEOGAMES

The fascination with and research on the cognitive and learning processes that occurs during videogame play is becoming increasingly prominent—so much so, that a national conference dedicated entirely to this topic was launched by Dr. James Paul Gee in 2004 as a venue for scholarly discourse (Games, Learning and Society, GLS, www.glsconference.org). In this growing field of gaming research, scholars are addressing the nature of cognitive and emotional development, literacy practices, and thinking and learning during gameplay in a range of gaming environments and genres (Barab, 2009; Gee, 2003, 2007; Shaffer, 2006; Squire, 2002, 2006, 2009; Steinkuehler, 2007, 2009a, 2009b). This line of research focuses on assessing different kinds of learning while playing games released commercially for entertainment (e.g., World of Warcraft, Grand Theft Auto, Zelda, Quake, Dance Dance Revolution, Guitar Hero, Rock Band), or edutainment games (e.g., Civilization, Quest Atlantis) in various contexts (mostly out of school, in homes, clubs, and afterschool programs). These scholars claim that videogame players are learning—they do not just click the controller or mouse mindlessly or move around randomly. Indeed, players are found to engage in unlocking rich storylines, employing complex problem-solving strategies and mastering the underlying systems of any given game or level. Researchers offer solid evidence that children learn important content, perspectives, and vital 21st-century skills from playing digital games (e.g., Salen, 2007; Lenhart, Kahne, Middaugh, Macgill, Evans, & Vitak, 2008; Thai, Lowenstein, Ching, & Rejeski, 2009). Scholars are also documenting the richness of players' collaborative inquiry, the complexity of play patterns for exploring information and identities and the emergence of complex forms of learning and participation during gameplay. They assert that through playing videogames and participating in videogame worlds, players can develop understandings and dispositions that are difficult to achieve otherwise. It is critical to note that these researchers' key objective is to document and demonstrate that gaming can provide learning experiences, which are rich and difficult (perhaps impossible) to replicate in other circumstances or learning contexts—especially in traditional schools.

## RESEARCH INTO MODIFYING AND MAKING GAMES

Simultaneously, a growing number of scholars in the learning sciences, digital media literacy, and education fields have researched and/or developed innovative learning programs engaging students in various aspects of game modding and design (see Duncan, 2009; Flanagan & Nissenbaum 2007; Games, 2008; Hayes, 2008; Hayes et al., 2009; Kafai, 1995, 2006; Klopfer, 2008; Pinkard, 2008; Salen & Zimmerman, 2005; Sheridan, Clark, & Peters, 2009; Squire, 2002, 2005, 2006, 2009a, 2009b). They share the view that modding existing videogames and designing game systems is itself essential to digital literacy, as well as to the formation of knowledge and values, scientific thinking and problem solving, self-regulation, and brain development overall.

Some scholars in this group report results about learning environments and tools that utilize game-design platforms (e.g., Gamestar Mechanic, Scratch, Game-Maker, or 3D-engines, Alice, and Maya); others focus on the learning value of modding that can be done within commercial games, by using toolkits that companies make for game players (such as those provided in Civilization or The Sims).

## RESEARCH INTO LEARNING GAME MAKING

The research about the learning value of game modding and design connects to Constructionism, a learning theory historically associated with my mentor and colleague Seymour Papert and our colleagues at the MIT Media Lab (www.Papert.org). Since the early 1980s, Constructionist learning theorists and practitioners have emphasized the epistemological value of "MIT-style" computational environments as tools for thinking, tinkering, and learning (Papert, 1980, 1993; Harel, 1988, 1989, 1991; Harel & Papert, 1990, 1991; Kafai & Resnick, 1996). These programmable environments have been designed to facilitate learning and self expression while tinkering with digital media,

**FIGURE 1: Globaloria.org presents the program's objectives, educational benefits, student projects, and participant reflections – through photos, videos, slides, and games."**

programming software, and building dynamic models, simulations, computer games, as well as other complex digital artifacts involving robotics. Researchers focused on figuring out how these tools were used as vehicles for driving all kinds of powerful learning and cognition (Harel Caperton, 2005).

Similarly, my colleague John Seely Brown (www.JohnSeely-Brown.com) provides a closely related theory that also advocates the general learning principles of Constructionism. For the past 10 years, he has been emphasizing the value of learning in communities of high-density computer cultures that resemble

the ways MIT mathematicians, artists, musicians, and engineers collaborate on complex design problems. In his speeches and essays, Brown frequently highlights the importance of learning through tinkering in a studio-like environment and a "learning-to-be" approach (in contrast to "learning about") to role-taking that emerges from becoming a full participant in a digital learning community (e.g., Brown & Adler, 2008). Moreover, much like the MIT Constructionists (including Seymour Papert and myself), Brown is known for his examples of workshop-style settings, which reinforce the belief that significant global problems are likely to be systemic and can't be addressed by any one specialty. Therefore, students need to feel comfortable working in cross disciplinary teams that encompass multiple ways of knowing and learning.

In 2006, my team at the World Wide Workshop Foundation revitalized this Constructionist tradition through a social-innovation initiative called Globaloria, a global platform or social network and a comprehensive learning program for learning how to create educational web-games and simulations.[2] With a focus on serving (and researching) those who are technologically-underserved and/or economically-underprivileged, the Globaloria networks engage both students and educators to simultaneously master social media technology and learn how to create original web-games with a socially-conscious and/or educational purpose. Breaking away from the typical MIT computational tradition (e.g., the programming languages Logo, Microworlds, StarLogo, NetLogo, Scratch), the Globaloria network participants learn to program in popular, industry-

**Globaloria is the largest effort to date to introduce into public schools and public universities the learning of STEM subjects and computational media literacy through a structured, results proven game-making curriculum.**

FIGURE 2. Student game designers present their games to industry leaders. Globaloria increases technical aptitude and helps students develop interpersonal and presentation skills.



**Screen 1.** Title screen (when game opens). The Cosmic Energy Team designed two options for the user: Play the game, or learn about the game, how it was made, and who made it.

**Screen 2.** Skull Level. Rolling over the bones with the mouse reveals the scientific name of the bone. Clicking on the bone enables the player to drag it to the picture of the skull. Clicking on the skull graphic in corner enables the player to continue when finished.

**Screen 3.** After the player correctly completes the drag-and-drop, they are asked questions related to that level. Right answers score two points, and wrong answers lose a point.

**Screen 4.** Arm-Hand Level: Similar interaction pattern as in Skull Level.

FIGURE 3. Some students learned science by programming a game they named "Learn the Bones."

accepted, globally-employed languages such as Flash ActionScript and MediaWiki (in conjunction with other Google tools and Web2.0 applications) by using an open, yet structured and comprehensive curriculum and blending in-class with virtual lessons.

Programming games on Globaloria.org (see Figure 1) also engages students in an interest-driven curriculum, allowing them to play games, but also to explore and develop their own games following their individual and situational interests.

Students use computational programming tools and Web2.0 technology to generate a self-determined motivation for learning. In other words, as students engage their curiosity and imagination through teamwork on game construction, they also "learn-to-be," by taking full participation in a networked, software design-based learning community.

A complementary "Research 2.0" agenda[3] has been under conceptualization and development in the past two years to study and assess the effectiveness of this MIT-inspired learning formula. We gradually formed a network of independent researchers who are beginning to observe results indicating the educational value of game making and its contribution to digital literacy and social, emotional and cognitive development especially among low-income students and educators in both rural and urban communities (Harel Caperton, Oliver & Sullivan, 2008, 2009; Knestis, 2008; Nicholson et al., 2009; Harel Caperton & Sullivan, 2009). Globaloria is the largest effort to date to introduce game-media learning and literacy into public schools and public universities (see Figures 2, 3, 4, and 5).
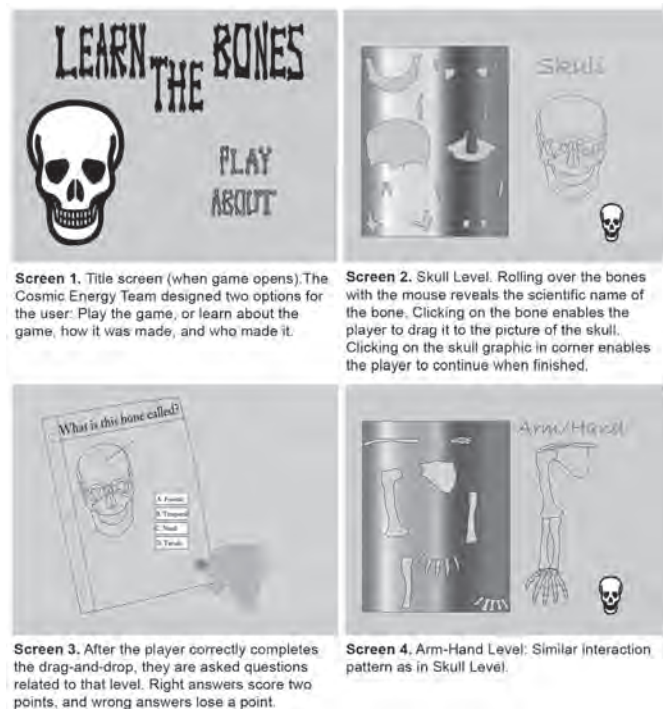
## LITERACY AND "GOOD VIDEOGAMES"

James Paul Gee's ideas about the cognitive and learning processes that occur during videogame play are growing in prominence. In 2007, Gee published two seminal books on this topic, *What Video Games Have to Teach Us about Learning and Literacy* and *Good Video Games and Good Learning*. In both books, the central theme is that good videogames reflect good principles of learning in their design. Gee focuses on the learning and literacies that develop among players of popular videogames based on learning principles reflected in the game structure itself.

Gee emphasizes an important idea that all literacies must be addressed in relation to specific semiotic domains. He deals with videogames as one such semiotic domain and explores the processes involved in becoming digitally literate therein. Gee refers to people who play the games as "affinity groups" who, in attaining literacy, are able to situate decoded language, images, and other forms of representation within the domains in which they are put to use. Once literacy is established in this contextualized manner, the player is operating in a semiotic domain.[4] Furthermore, Gee (2007b) formulates a number of key learning principles[5] that are intrinsic

to the semiotic domain of videogames. I have selected five to highlight here:

Principle 1: **Active, Critical Learning**: all aspects of the learning environment are set up to encourage active and critical, not passive, learning.

Principle 2: **Design Principle**: Learning about and coming to appreciate design and design principles is core to the learning experience.

Principle 3: **Semiotic Principle**: Learning about and coming to appreciate intercorrelations within and across multiple sign systems as complex systems is core to the learning experience.

Principle 4: **Semiotic Domains Principle**: Learning involves mastering (at some level) semiotic domains and being able to participate (at some level) in the affinity group or groups connected to them.

Principle 5: **Meta-level Thinking about Semiotic Domains Principle**: Learning involves active and critical thinking about the relationships between the semiotic domain being learned and other semiotic domains.

These principles address important learning processes that have been built into games by their designers. The above principles (and 25 others listed in his book) suggest that there are in-depth learning-processes at work while playing games. Indeed, game designers learn a great deal as they design game systems, and in "good games," some of their learning and system-thinking is transferred to those who play their games.

In his writings, Gee emphasizes how, through good game design, people can leverage deeper learning as a form of pleasure in their everyday lives, without any explicit schooling. He argues that one way to deliver good learning in schools and workplaces would be via games or game-like technologies and calls for making students into full and productive partners in how we design any enterprise in which we use games for learning.

Gee also explores the value of playing games for learning about systems and understanding complex concepts as well as the way things work in the world. Furthermore, he investigates the potential value of using game engines for knowledge and skill assessment of students' learning.

## THE IMPORTANCE OF LEARNING TO PROGRAM GAMES TO GAME-MEDIA LITERACY DEVELOPMENT

Despite Gee's important contributions (as well as those from the movement he has inspired), a deeper focus on
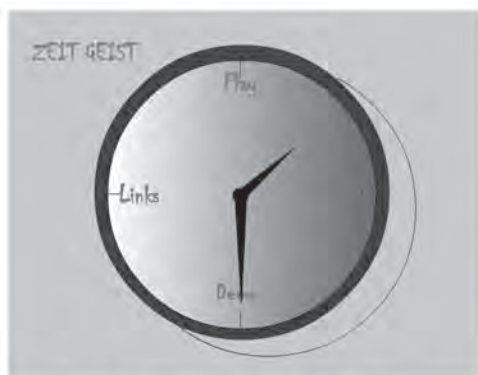


**Screen 1.** The opening title to the game gives players the options to see a demo, read the rules, look at links (related to the content of the game), or play the game.

**Screen 2.** Zeit Geist Game's Menu. Player can choose which country and time period to enter (Egypt or Greece).

**Screen 3.** A scene from the Greece level. The main character, the background scenes, as well as the music and sounds effects change depending on the nation and time period.

**Screen 4.** A scene from the Egypt level. Player can see the Chips score (top left), and always select to go back to the main menu, or to mute the music and sound effects (at bottom left and right of screen).

**FIGURE 4. Some students learned world history by programming an educational game they named 'Zeit Geist.'**

the potential role of game building, designing, and programming in cognition, learning, and digital literacy development has been missing from the body of research on "good learning" while playing "good videogames." The question I am posing to "gameplay researchers" (including Gee) is this: How can players' system-understanding and literacy in the semiotic domain of videogame playing practices be complete without providing them (the players) with the opportunity to learn how videogames are made through engagement in the game production process? In other words, while 'systems content' may be more or less present and conveyed through game play, working on game creation arguably conveys understanding of game components and game systems through a more intimate and interdependent epistemological context.

At our AERA session, I strongly suggested to Gee that game-playing is like "reading" and game-making is like "writing" in that they must be introduced to learners hand-in-hand from a young age. One learns to read better and more critically by learning creative writing and conversely learns to write better and more creatively by reading and analyzing the symbolism in books and genres. It does a disservice to the aim of any literacy education (game literacy included) to overlook the mutually constitutive relationship between reading and writing.

## LINKING GAME-MAKING PRACTICES TO CONSTRUCTIONISM

In the 1980s and early 1990s, when videogames were still a burgeoning industry, my research focused on children's creation of instructional software games about mathematical concepts related to rational numbers and fractions (Harel, 1988, 1989, 1991; Harel & Papert, 1990). I found that the meta-cognitive

process of representation while designing software games requires the designer to go beyond a mechanical interaction with an existing mathematical game and to develop ideas and knowledge in a symbolic form through programming. In my early research in this area, young students used a programming language to represent and teach fractions in a complex set of visual multimedia symbols by coding the design and interactivity in Logo. With my then graduate student, Yasmin Kafai, we found that engaging students in making instructional games to teach younger students about the subject material (vs. creating non-instructional games) cultivated deep epistemological thinking, providing them with opportunities for learning how to learn. It has been theorized (and subsequently proven) over decades of research that learners' conscious construction of representational and/or instructional computational artifacts, or a computational model as a technologically-mediated



**Screen 1.** Food Fall is a health game where players must control a character moving with a tray trying to catch healthy food and avoid the unhealthy food.
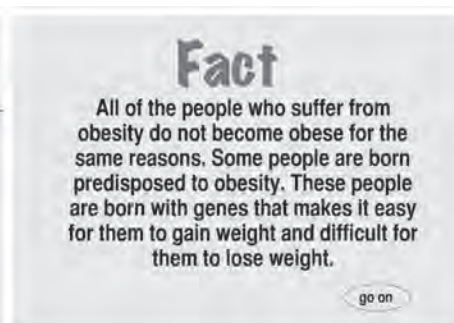
**Screen 2.** Between game levels, facts about obesity or healthy eating habits are presented. Research was conducted into the topic of obesity in our nation and what would be a useful interface and play interaction for fostering healthier diet.
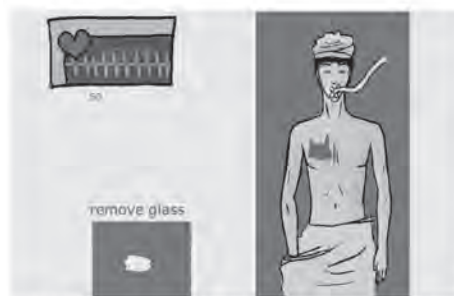
**Screen 3.** Emergency Surgeon is a health game where players select different medical tools and do surgery. This game includes a health bar and drag-and-drop interaction.

**Screen 4.** When Zombies Attack is a math game where players must solve sets of mathematical problems to defeat the zombies that have taken over the school. The game includes a timer and a scoring system.

**FIGURE 5. Some students examined health-related issues by programming various educational games about healthy eating habits to combat obesity.**

public entity, is highly effective in building knowledge and meaning for the learner and his/her peers (e.g., Harel & Papert, 1990, 1991; Wilensky, 2003). This has led to a widespread conclusion that the act of programming (even at a beginner level) is an essential element toward becoming digitally literate.[6]

In the mid 1990s, I took my vision to the Internet and launched MaMaMedia.com, an award-winning website for children. MaMaMedia Inc. was founded during Web 1.0 or "old Internet era" and in 1995 was envisioning and pioneering the many participatory media-making-and-sharing principles we now use in the "new Internet era" (Harel, 1996, 1997, 1999). In three years it reached over 50 million children, parents, and teachers from 36 countries. At the end of the 20th century, in response to the need for all children to develop new learning skills and digital literacies for the coming millennium, I firmly linked the "3 Rs" of traditional education, Reading, wRiting, and aRithmetic, with the "3Xs": eXploring, eXpressing and eXchanging ideas of new digital media. I brought computational creativity and self-expression together with media technology via browsers to millions of children worldwide, driven by the belief that becoming digitally literate was about actively designing and realizing digital media and not just passively consuming it (Harel, 2002).

As the second decade of 21st century begins, we stand at a pivotal moment in the advancement of videogames, web-games, and web technologies. The computational, social, and collaborative principles inherent in the Constructionist framework can now be applied in the context of collaborative game—making projects online. Web 2.0 tools allow for learners' conscious construction of a computational public entity to extend beyond their ongoing face-to-face interactions and pre-internet desktop computers into the realm of global networks founded in collaboration and peer-production online.

Much like MaMaMedia, with the invention of Globaloria, Constructionism has influenced the design



MOVING FROM STEM TO STEAM (A FOR DIGITAL ART AND DESIGN LITERACY): A GLOBALORIA STUDENT SKETCHES A PAPER PROTOTYPE OF HIS GAME IDEA, WHICH IS A PRE-PRODUCTION STEP STUDENTS TAKE IN CREATING THEIR OWN VIDEO GAMES.

of program components that engage participants in experiential, project-based design, programming, and collaborative experiences within high-density computer environments in the design-studio style. I hypothesize that the Globaloria activities of game design and programming, wiki-based teamwork and Web 2.0 communication, collaboration, and project management are particularly powerful in cultivating transferable contemporary learning abilities and encouraging game-media digital literacies in participants (see Figure 6).

## THE SIX CONTEMPORARY LEARNING ABILITIES: A THEORY-IN-THE-MAKING

The theoretical framework utilized by the World Wide Workshop Foundation to guide the Globaloria program's research is called the "Six Contemporary Learning Abilities with Technology" (6-CLAs) (Reynolds & Harel Caperton, 2009a, 2009b; Knesis, 2008). It is centered on connecting today's youth to computational thinking by making and playing games and thus becoming game-media literate. The World Wide Workshop Foundation believes that the six stipulated Constructionist game-media literacies and competencies are necessary for effective learning and working in today's technology-driven landscape and global workplace. The Six Contemporary Learning Abilities (6-CLAs) are:

- CLA-1: Invention, progression and completion of an original project idea (educational game or simulation system)

- CLA-2: Project-based learning and project management (managing game production in wiki-based networked environment)

- CLA-3: Posting, publishing and distribution of digital media (game designs, video prototypes, graphics and design notes)

- CLA-4: Social-based learning, participation and exchange (sharing game ideas, process notes and code)

- CLA-5: Information-based learning and research (purposeful search and exploration related to game topics and programming)

- CLA-6: Surfing and analyzing websites and web applications (for game code and tips)

This framework is the first to propose integrating Construction- ist literacy elements into the domain of gaming and applied digital lit- eracy typologies. We hypothesize that gamemaking is key to developing the above core competencies. Moreover, by developing these competencies, students cultivate a variation of Con- structionist digital literacy, which provides new opportunities for clos- ing the digital-literacy gap between all types of learners and educators (i.e., the "haves:" digital natives, privileged suburban and urban youth, as well as the "havenots:" low- income inner-city and rural children and adults).[7]

## TWO TRADITIONS AND TWO BODIES OF WORK: WHAT'S NEXT?

While Gee's theories on the key learning principles acquired through game-playing are well worth investigating further in dif- ferent contexts, his privileging of game-playing orients his work toward "reading" and neglects the "writing" side of game media literacy development. In con- trast, the Constructionist digital literacy framework highlights the importance of self-construction of knowledge representations and even prioritizes learning game design and pro- gramming (especially within networked, transpar- ent and collaborative wiki-based environments); it underscores "writing" as an essential project-based component for the development of a fuller and richer game-media literacy, with attention to the Six Contemporary Learning Abilities (6-CLAs) (Harel Caperton et al., 2008).

Despite relevant differences, Gee and I both stress the importance of the process of learning to learn while gaming (in both playing and designing), and we
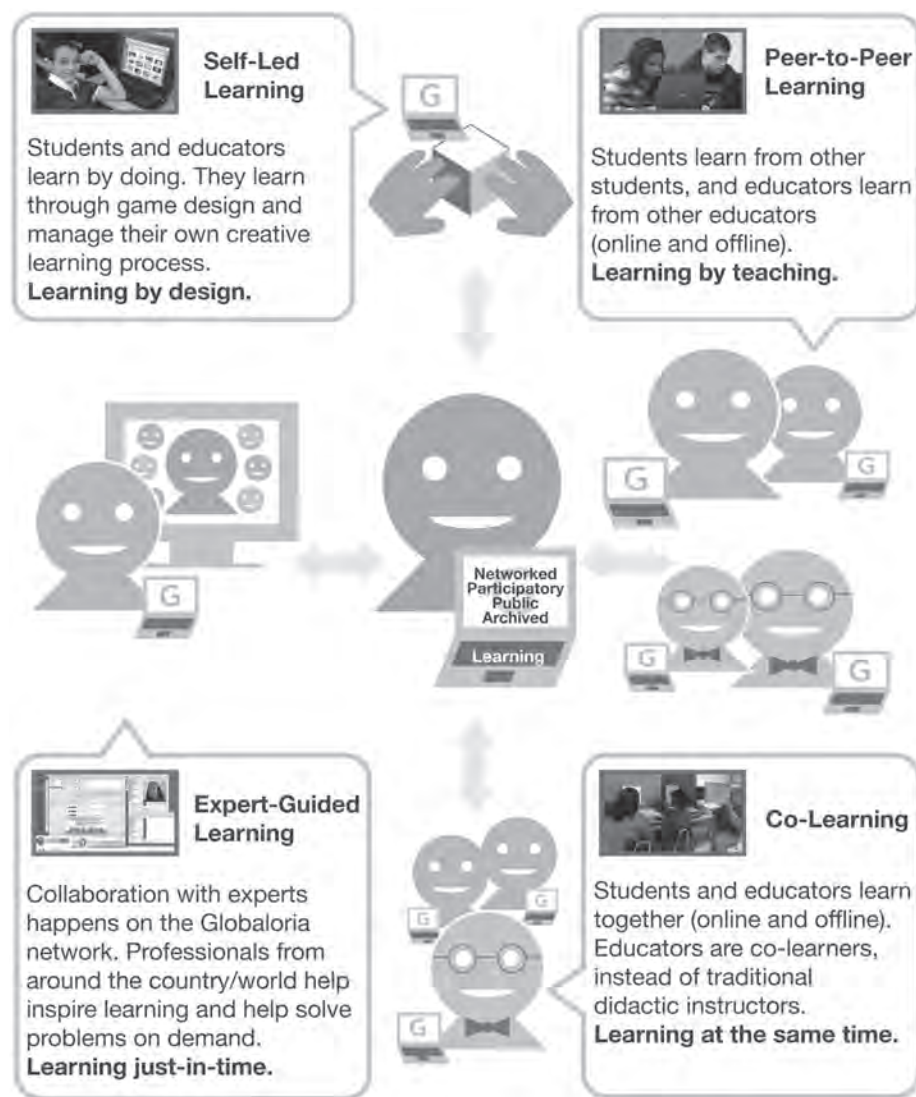


**FIGURE 6. The Globaloria Learning Formula: Situating game design in a studio-based, networked learning for cultivating game-media literacy knowledge and skills that includes both reading and writing games and content learning too. Students and educators work in class as well as virtually, individually, and collaboratively, with the transparent help of peers, educators, or experts, on demand.**

both encourage researchers to identify better meth- ods for observing and tracking the emergence and evolution of concepts and artifacts that occur across extended time frames of game literacy development. Gee and I believe that a learner's understanding of any issue, concept, or system is facilitated and distributed across the network (Globaloria.org) or community (of a commercial videogame players) and that cognition is situated and distributed in both a gameplay and/or game-making activities. Therefore, capturing learn- ing-in-the-making while playing/reading and/or de- signing/writing is necessary in order for this combined game media literacy theory to advance.

Similar to the interlaced relationship between learning reading systems and writing systems in print-media literacy, I argue that an integrated set of several game-media activities (including game-playing, game-modding and game-making) should occur in parallel in today's Web 2.0 landscape both in and out of school (Harel Caperton, 2009). There is also an urgent need (in the United States and worldwide) to cultivate the desire in youths to participate in computational and engineering thinking and learning of their own volition. Motivational initiatives are especially needed amongst girls and minorities. Designing and programming games and sims, or even modding games and sims, may very well be a useful gateway to STEM education and innovation development.

These broader, integrated conceptualizations by both Gee and myself suggest a new necessity for youths to play games of different genres for the sake of engaged learning and system-thinking. This necessity extends to the design and programming of games in different genres and on different topics in order to yield transferable outcomes and competencies essential to effectively navigate today's technology-driven world and a highly-demanding participatory citizenship in our society that requires both reading and writing games. Collectively, our aim is to encourage researchers and theorists to investigate the importance of gaming with regard to cognition and advance the gaming and learning discourse generally. This goal will be achieved by addressing the key significance of both game-playing and student-centered game-production experiences in learning and in the successful acquisition of comprehensive game-media literacy.

In closing, readers are invited to continue the dialogue I had with Jim Gee and our moderator Betty Hayes and our audience at AERA, and link their minds to the vision that is spelled out in this essay. While most of the basic parameters are laid out here and in the mentioned literature, a great deal of work on a much larger scale is needed on the ground, especially in these far away corners inside the failing public schools of urban and rural low-income communities. In our session, Gee expressed his rather strong skeptic views about our ability to transform failing schools with good videogames or game-making programs. However, I strongly believe that it is possible and necessary to do so. How else can we help those who are not yet connected regularly to highspeed Internet, who cannot afford or are not yet fluent with videogames and Web 2.0, and never experience design-based learning projects and Constructionist learning? We can't lose time. We need to reach them in schools. I personally have a strong sense of urgency to move the conversation (and practice and research) from a single focus on assessing 'playing games' in informal settings (homes, afterschool clubs) into 'making games' on purposeful content in and out of school — mainly because it embodies the essence of what good contemporary learning is all about (I call it STEM-Square), and some kids can only do this in their schools.

This essay is therefore a call to action for my fellow educational researchers, social entrepreneurs, developers, and game designers: In a world in which the ability to imagine, represent, and create, not just consume, digital media will define citizenship, measure productivity, and enable success, students can afford no less.

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# ENDNOTES

1   This is a summary of a paper I presented on a panel with Prof. James Paul Gee (James.Gee@asu.edu) at the 2009 Annual Meeting of the American Education Research Association (AERA) in San Diego, Interactive Symposium of the SIG Applied Research in Virtual Environments for Learning. Jim Gee is professor at Arizona State University and a member of the National Academy of Education. His book *Sociolinguistics and Literacies* was one of the founding documents in the formation of New Literacy Studies, a field devoted to studying language, learning, and literacy. Professor Gee's most recent work deals with videogames language, and learning; he shows how they can help us think about "good learning" and the reform of schools.

2   See: www.WorldWideWorkshop.org  and www.Globaloria.org.

3   See: www.WorldWideWorkshop.org/Reports

4   Semiotics is defined as the study of signs and symbols and how people construct meanings from those signs and symbols. There is the signifier (what the word/text/artifact is called, an arbitrary designation–book, film, game) and the signified (what it is interpreted to mean). The key is that once the signifier is made public (in a published videogame for instance), the writer/developer no longer has control over how it is received or understood by those who read/play/watch it.

5   See Appendix of Gee's book *What VideoGames Have to Teach Us About Learning and Literacy,* 2007.

6   In the past three decades, Constructionist scholars (myself included) were often challenged regarding whether or not Constructionist learning must always include programming to qualify. Is video production considered Constructionist? Is building in Second Life without any programming knowledge, by simply combining prims and dropping in a pre-programmed script purchased from somewhere else considered Constructionist? Is using templated environments for building digital media artifacts considered Constructionist? My personal response is: Why not? I am not as 'pure' as many of my colleagues. I believe in the power and value of representing knowledge through programming (as expressed in Globaloria) but I also believe in the value of media making for learning (as expressed in MaMaMedia). Constructionist learning comes in many forms–from Tinker toys, to Logo, to Mindstroms Robotics, to Game Maker, to Flash. One thing is sure: all these tools and environments exist on the "writing side" of the literacy equation.

7   In another paper (with Rebecca Reynolds, 2009) we describe the 6-CLAs as a conceptual framework established as a criterion for contemporary academic success. Theories have two central properties: they must be falsifiable and have a sense of process (theories are scientific, and must be tested). The CLAs adhere to these theoretical properties in asserting our goal: the mastery of the CLAs could lead to closing the digital literacy gap, including computational and game-making literacy gaps. Globaloria maintains a sense of process in its implementation, and the Workshop and its research affiliates are implementing and testing methods for assessing the success of Globaloria in cultivating "Constructionist digital media literacy."

# THEORY INTO PRACTICE AND IMPACT:

## *Learning to Make Games for Impact:*

### CULTIVATING INNOVATIVE MANUFACTURING SKILLS FOR THE DIGITAL ECONOMY

*Idit Harel Caperton, PhD*
**[FEBRUARY 1, 2012]**

The thesis of this paper is that a comprehensive curricular system that equips children and educators with tools and resources to play impact games and create their own games for impact achieves goals of educational transformation, economic development and profound social benefits. In a world where so much can be learned from playing games, learning to make games improves even further the technical and intellectual skills—of content research, innovative and analytical thinking and problem-solving—that can empower students to participate more fully in the social and civic world in which they will live.

**Learning to make games, especially games for impact, prepares students for the jobs of the future (jobs that are actually going begging today!) for the new manufacturing represented by coding and videogame literacy, and for the new management represented by tech-driven creative and quantitative conceptualizing. As the digital economy grows each year through the creation of blue-collar IT jobs, game-making prepares a workforce to succeed in this economy. And also because games are the language of this generation, learning to make games, especially educational games, endows today's generation with the means of self-expression and the mastery of collaborating across a socially networked environment that will enable them to realize their potential as individuals.**

In the past six years, the World Wide Workshop has pioneered a model for such a game-making STEM curriculum, and what we have learned from implementing this model in a variety of contexts over the years, is the source for much of the content of this paper. Our model, Globaloria, is the first and largest social learning network where students develop digital literacies, STEM knowledge and global citizenship skills through game design, and has been since its birth a living example of one potent way to implement and spread the transformative power of playing and making games for effecting change in both learning and behavior, through bringing joy, passion and engagement to the learning front.

### A CALL FOR LEARNING GAME LITERACY: OPENING THE DOOR TO EDUCATIONAL TRANSFORMATION

Games are essential for learning and change because they are the rising language art of our time and constitute one of the most potent of today's forms of literary expression. As we consider expanding on the creation of games for education, we must remember that there are always two sides to any literacy equation. Literacy in games—not just consuming them but also creating them—is therefore equivalent to literacy in reading and writing text. It is the *sine qua non* of education going forward.

The numbers tell part of the story: Worldwide video-gaming is bigger than the music industry, bigger than DVD sales, bigger by far than movies in a movie theater, bigger than television. By 2007, there were 217 million online gamers worldwide. They are more diverse than most of us realize: nearly as many women as men, nearly as many older people as teenagers. The divides are closing

fast: gaming is truly becoming a universal language, and in the age of Web 2.0, interactive gaming media platforms are how the world connects and communicates. Fluency in playing computer-based and web-based videogames from an early age is thus essential to participation in the global economic and civic future. In fact, quality of expression in game literacy will increasingly define leadership—in learning and business, but also in democracy—by mobilizing communities to make decisions, change and act.

Like any language, video-gaming has its own structure, grammar and rules of usage. Mastering it all begins the way text literacy begins—with ABCs. In video-gaming, the alphabet is the designing and coding of game programming. As fluency is gained, just as with any language, the possibilities for expression open up; this is why we can see today game-media formats as vehicles for stories, literature, and poetry.

**Games are today's form of self-expression. They carry the narratives of our lives. They illustrate, advocate, argue, and persuade. Learning to write games is today's creative writing course.**

Games are today's form of self-expression. They carry the narratives of our lives. They illustrate, advocate, argue and persuade. As one middle-school creator of a game about civics content said, "My partner and I chose this type of civic game because we think that kids need to understand the legal system at an early age so they'll understand what really happens in a courthouse…and be prepared." Or another student said. "Girls need to understand why getting pregnant in high school is not a very good idea. My game is teaching them that it's expensive and also not good for their future."

Making games responds to the way the human brain likes to work—in social communities—and kids take to game-making like ducks to water. They form communities virtually, over the Internet, where they are able to act beyond the constraints of time zones and geography. The games they create, because they are complex systems, are fun to figure out or create. Mak-

ing games is a chance to doodle and draw—and do you know a kid who doesn't like to doodle and draw?

Games can explore even the most complex, most difficult ideas. Just as a visionary game designer like Will Wright can turn principles of urban planning, genetics and biology into what he calls "interactive toys," such that his game-players find they are actually constructing and designing the concepts as they play. Kids, as young as eleven, are able to find their voice as they gain fluency in game literacy, giving free rein to their imaginations and feelings, and connecting to concerns about their world.

In addition, learning game-making, as in our Globaloria model, puts children on the path to participation in a global future. It's simple: If you know how to program games and simulations, you can become part of a wider conversation—you can engage with others in deep learning; you can form communities that bring people together; you can mobilize for change; and you can influence and inspire—the very core of education.

Game literacy is thus an essential first step to opening the doors to the future for all children, and it is a key to educational transformation.

### SOCIAL CONSTRUCTION OF KNOWLEDGE: HOW GAMES AND SOCIAL MEDIA CAN TRANSFORM EDUCATION

With games as their language and digital media the artifacts of their expression, young people, via social networking, have made the Internet the backdrop of their lives and the context of their daily activities. This represents a significant opportunity for educators—if only we can harness the power in these facts to advance the essential skills, inventive thinking and lifelong learning that the 21st century will require. We are blessed

with an embarrassment of riches for doing so—a never-ending plethora of technology devices, platforms and tools; increasingly widespread access to high-speed connectivity; and young people's early familiarity with computing and digital media. All of these are assets that widen the field of options for learning. At the same time, the vast range of options may have made it more difficult for educators to discern which is the right medium to effect cognitive change and development, and how to use the medium with maximum effectiveness to prepare students for the economic and civic realities they will face—and for the capabilities of mind that those realities will require.

The World Wide Workshop was established precisely to answer that need—specifically, to create functional models for using games and social networking to advance self-directed or do-it-yourself (DIY) learning. Over the past five years, we have been building and implementing the Globaloria social learning network for game-making, the signature creation of our commitment to educational transformation. The aim of Globaloria is to engage teams of students in learning, step-by-step, how to create their own game media on the Internet using a variety of social programming tools. Globaloria is designed specifically for making games on topics related to socio-cultural issues, current events, and civics- or STEM-centered core-curriculum content in compliance with state-mandated goals (although it is adaptable, as will be discussed later in this section, to virtually any subject matter). In creating their games, Globaloria students learn course content, computational and technological skills, and the capabilities of critical thinking, research, problem-solving, analysis, and collaboration with others in-person and via social networking. These are precisely the skills that the jobs of the future will require as entry-level basics; they are equally essential to ensuring these students the opportunity to realize their individual potential and participate fully as citizens in increasingly digital communities.

We believe, therefore, that Globaloria constitutes an important working model of what a game-making curriculum can achieve for both education and the future of games for impact.



GLOBALORIA INSTRUCTOR CARLOS INDA (CHRISTOPHER SCHOOL, SILICON VALLEY, CA) CHECKS HIS STUDENTS' PROGRESS. THE WORLD WIDE WORKSHOP IS PARTNERING WITH SCHOOLS AND AFTERSCHOOL GROUPS THROUGHOUT SILICON VALLEY TO EMPOWER THE COMMUNITY THROUGH STEM LEARNING.

### A MODEL FOR DIY LEARNING: EPISTEMOLOGICAL ORIGINS AND A RESULTS-PROVEN OPERATING PROPOSITION

The design-based, constructionist, DIY model that inspired our Globaloria model grew out of years of cognitive research led by David Perkins on "knowledge as design," Howard Gardner on creativity and "multiple intelligences," and Seymour Papert on "children and computers," and performed throughout the 1980s and 1990s at the Harvard Graduate School of Education's Technology Center (ETC), and out of research by the Epistemology-and-

Learning Research Team (E&L) formed by Seymour Papert and his colleagues at the MIT Media Lab.

It has derived from the core Constructivist, Social-Constructivist and Constructionist concepts that hold that whatever the subject matter assigned for learning and instruction, whatever the problem or the thinking task is, and however hard it is, children learn new knowledge best when they are the designers, builders, navigators and key operators of their own learning. For a number of reasons, the concept works with particular effectiveness when computational digital media are the construction kits—that is, the expressive and simulative materials, equivalent to pencils, crayons, paints, clay, blocks and even Lego bricks—that children use to do their thinking, doodling, and reflecting.

First, digital media and programmable computing technology are by definition avenues of integration. Just about all the activities students can do on a computer connect to one another and to larger tasks and activities outside the digital realm. This endows even the most abstract or esoteric learning students are tasked to undertake with practical usefulness. Once they see how these learning materials and activities pertain to other materials, activities and ideas that are part of their lives, their minds are ignited and they want to learn more.

Second, the technology enables each student to match the task at hand to his or her own passions, interests and cognitive abilities, making the learning

**Early research shows that DIY learning through game-making improves students' cognitive skills, computational thinking, grasp of the subject matter, and proficiency in mathematics and science, computer programming, computational and critical thinking, and problem-solving.**

more personalized and valuable. Moreover, it allows time and space for reflecting on the content of what has been learned and on the process of learning itself, thereby providing further exercise of cognitive ability.

Third, through socializing and social networking, students can be exposed to different projects and contexts and can brainstorm, question, communicate and test their ideas against the ideas of others, thus improving key processes of reflection, cognition and meta-cognition. More connections can be made in digital spaces with digital tools—between knowledge domains, and among people, their ideas, and their digital artifacts.

Moreover, in creating, not just consuming, what is increasingly their generation's idiom—videogames—students can master the language and grammar of what has become one of this generation's most significant new language arts and one of its most potent forms of literary expression. This is, in essence, the extra payoff of the learning theory: In *doing* the integrating, self-learning, socializing, and connecting, students learn the very skills they need to participate fully in their civic and economic future, including the language—i.e., the very means—of participation.

Early research on our Globaloria model bears this out. It shows that the DIY learning through game-making improves students' cognitive skills, computational thinking, grasp of the subject matter, and proficiency in mathematics and science, computer programming, computational and critical thinking, and problem-solving. Moreover, teachers claim that

for some students, these effects prove viral—that is, they spill over into other classes in other subjects.

This is a long and necessary process. It requires time. It is a desired cognitive change that can only happen through systemic educational transformation that equips students with the learning and thinking skills their future economic realities will require. Such change will empower them to be active, productive, and engaged citizens in social communities—both personal and professional—that blend atoms and bits, the physical and the digital, in every aspect of life and society as never before.

### BLENDING BEST PRACTICES OF GAME PRODUCTION AND NETWORK LEARNING WITHIN CLASSROOM LEARNING AND SOCIAL-CLUB LEARNING

Using the right tools to stimulate successful game-making for impact will, however, require some shifts within the educational environment.

We take it as a given, backed by epistemological and neurological research, that learning is by nature a social process—i.e., that our understanding of content is effected, or certainly enhanced through a process of construction and conversation about the content we construct and through grounded interactions around problems or issues or actions related to that content. Our design of the Globaloria model, for example, seeks to exploit that finding through Constructionist principles of hands-on, DIY learning, blended with project-based teaching—both of which are by nature and definition social processes.

That has meant challenging the traditional classroom model of the teacher as accepted expert standing in the front of the room lecturing seated students lined up in neat rows, pouring over heavy textbooks and completing static worksheets. Our alternative learning configuration functions as a "studio" managed by a teacher who is carefully trained to blend the personalized, self-paced, passion-driven learning within both virtual and physical resources. The aim is to combine the best practices of game production, net-

worked learning, classroom learning, and the learning that goes on in social clubs and community centers. It promotes self-paced learning—either individually or in teams—using a social media network and project-based learning that teachers facilitate but do not direct.

This is true social learning: A networked social media platform (with social profiles, learning logs, blogs, project spaces, file- and image-sharing, digital textbook and tutorials, virtual resources, helpdesk, and experts) is the vehicle for acquiring mathematics, design, engineering, science and civics content in compliance with any state-mandated standards and the new Common Core standards—as well as for acquiring social skills of collaboration, and the habits of team-driven analytical thinking and problem-solving.

With Globaloria, this transformative power of game-making within a social network has been successfully piloted in multiple contexts inside public school systems in five states (60 schools in 2012) as well as outside the classroom in afterschool clubs, a few summer camps, and one museum program.



A GLOBALORIA INSTRUCTOR GUIDES HER STUDENT THROUGH THE ONLINE LEARNING PLATFORM. GLOBALORIA PROVIDES AN OPPORTUNITY FOR EDUCATORS TO MENTOR STUDENTS AND TO HELP THEM "LEARN BY DOING."

## SCALING THE TRANSFORMATIVE POWER OF GAMES IN EDUCATION THROUGH A RESULTS-PROVEN IMPLEMENTATION MODEL FOR GAMES AND LEARNING

How can new learning models be disseminated so as to extend the reach of games for learning and enhance their impact? That is as inherent an element of the challenge of games for educational reform as is the content of the reform.

Our Globaloria model offers a paradigm for dissemination. Over five years, the model has consistently and successfully expanded its game-based learning innovation into various school systems and across a range of informal education services. It was designed and built to do just that.

With the aim of creating a collective learning culture suitable for youth ages eleven and older at all educational levels and in any educational context, we designed the model to be inherently flexible and "moveable." That is, we made it to be applicable across a range of educational and extra-curricular contexts in public schools, charter schools, alternative schools, afterschool or summer learning programs, community centers—and across all levels of learning—from middle school to college. It is sufficiently multiform as to meet academic standards as well as prepare students for innovation beyond school.

As a result, it is in action in middle schools, high schools, community colleges, alternative education programs, afterschool programs, and summer programs in various localities and situations in five states. Globaloria was first implemented as a special elective class and as an enrichment to core subject learning in the public school system of West Virginia, after which it grew into a statewide in-school education initiative for STEM learning. It is the required core of the curriculum at a charter middle school in East Austin, Texas; a district-wide STEM-learning model in middle schools and high schools in Hillsborough County, Florida; was tested as an intensive summer school program in Harlem; offered as a health education class in Brooklyn, New York; and is currently driving a community-transformation initiative in selected schools and the Boys & Girls Clubs in San Jose, California's Silicon Valley.

Key to this paradigm is that Globaloria is structured as a **turnkey package** containing everything a school or community center needs for implementation: five inter-connected platforms and a semester-long or year-long curriculum, game design and programming tutorials, game-content resources, and on-location and virtual support systems for educators and students alike.

The Globaloria implementation model comes with a comprehensive professional development platform of training and support, both online and onsite, for educators and facilitators whatever their level of technical savvy—including none at all. The professional development platform makes it possible to train all kinds of teachers—from novices to experienced veterans and including youth facilitators. Moreover, the professional development platform is designed to accommodate the realities teachers face on a day-to-day basis, enabling these educators to facilitate students' self-learning (not interrupt it) as it guides teachers on how to master a blended learning environment that integrates the virtual with the real, and computing game design with content studies. Summer training programs (four days for entry-level, two days for year 2 and one day for mentors), plus monthly webinars, online resources, a daily programming help desk, and bi-weekly check-ins by fellow educator-mentors provide teachers new to Globaloria with all they need to help their students succeed. The professional development platform does not ask educators to be perfect tech instructors; rather, it helps them become expert coaches who can learn and innovate along with their students as they enhance and guide their students' development.

In addition—and this is basic to the concept—participation in Globaloria requires no prior technological experience or computer skills. It is designed to accommodate children or grownups who have never owned a computer, who know nothing about Gmail, Google Docs, Blogger, MediaWiki, or Flash Actionscript, and who may not actually know what web design means. All can participate fully.

The Globaloria curriculum teaches participants how to work in teams, each with its own digital space that is a portal into a treasure trove of resources. Each team chooses a topic and then, working in a collaborative and supportive network environment, conceives, visualizes, prototypes, programs, modifies, edits, re-edits, fixes, polishes, and produces videogames on a range of topics.

Along the way, participants—teachers and students alike—learn the technical and computing skills that

are increasingly essential for full engagement in their future economic and civic life. They do so in a networked, resource-filled, collaborative community that is itself a vehicle for extending the reach of change and enhancing its impact.

Globaloria is built for scale and replication. In creating a flexible, networked learning environment, the Globaloria platform is capable of supporting millions of learners. Think of Wikipedia or Facebook—there is no limit to the number of students who can invent, build and share impact games using Globaloria's digital curriculum and platforms. Furthermore, the professional development support systems grow with every new educator that joins the network. Every trained educator becomes a peer-teacher and has the potential to coach and mentor. Finally, the learning network gets stronger and better with every new student contributing more content, best practices, and learning. So Globaloria is not just built to scale—it is built for scale. This is an important distinction in a world where innovations in education are generally small and unique—thousands of points of light—instead of a floodlight of transformation.

Here are some of the **key design principles** that give the Globaloria model its exceptional ability to be integrated into any educational context, and scaled up or down to fit any educational need:

1) **Making Learning Fun**: Learning of software engineering, computer science and programming, and game design is made fun and engaging. Adobe Flash makes it fun for both boys and girls to take their first baby steps in animation and coding. The social wiki network makes it fun to learn in a collaborative and transparent system. Everybody's creativity and accomplishments are shared, and no one ever feels lonely or "stuck" during the problem-solving process.

2) **Making Teaching Fun**: Professional development is key, whether in a formal or informal setting (summer or afterschool programs), and it demands a great deal of training onsite and online. Teachers and facilitators are instructed first on using Globaloria as creative learners, followed by training on how to lead high-quality Globaloria practice in their classroom. Engaging teachers in both playing and making educational games opens

their minds about how to manage and grow a successful implementation in their schools.

3) **Mentoring Program at the Core**: Experienced teachers are identified and trained to support new teachers on the network. A platform with training materials, tools, evaluation rubrics, and gaming resources is provided to mentors in a structured package.

4) **Ongoing Virtual Support System for Educators**: Globaloria provides such routine services as a Help Desk, expert-on-demand help, monthly webinars, game-expert feedback sessions, evaluation rubrics, blogs, newsletters, and more.

5) **Connected and Focused Community**: Educators join in a common purpose and shared process of learning and teaching (anything) through game play and game design. They learn together how to become active members of a vibrant community-of-practice that believes in the value of games for learning, design, and engineering.

6) **Ongoing Educator Feedback Incorporation System**: Educators' feedback, needs, tools, and ideas are incorporated fast into the learning network.

7) **Curriculum Alignments with Standards**: Teachers and principals adopt a new system if it fits into what they are required to do by their education systems. Although Globaloria reforms and transforms, it always connects to the teachers' assigned goals at the time they begin their Globaloria experience.

8) **Curricular Customization Examples Available on Platform**: Middle school teachers can customize the high school Globaloria model; a 'Globaloria-Lite' version is available for afterschool clubs; and models for teaching mathematics or social studies are also available.

9) **Technology That Works and Is Serviced on a Regular Basis**: Through Cloud Technology (Google Apps for Education, Adobe Connect, Blackboard, Zendesk, Box.net, and Open Source), the technology base of Globaloria is regularly maintained and updated. This is a hosted, managed system that is usable, scalable, fast, always on, and aligned with pervasive industry-standard technology. It is expansible—designed as a modular system allowing for ongoing enhance-

ments and growth. Participant data is analyzed on an ongoing basis to respond to feedback and to drive development.

10) **Industry Standard Tools and Linkages with Industry Professionals:** The Globaloria tools and tutorials, programming languages, resources, and methods of learning and teaching resemble any professional start-up or corporation in the tech and entertainment gaming industry. It is not a "school-ified" or "kid-ified" product, but rather a professional, real-world work/learning space. There are many live working examples of websites and games on the Internet that are made with Flash Actionscript, Media Wiki, Blogger, or Tumblr. Experts are available to give webinars, demos, feedback, and trouble-shooting help. This professional, scalable infrastructure contributes greatly to the transformative power of such learning experience.



STUDENT TEAMS IN BROOKLYN, NY USE GLOBALORIA TO EXPAND THEIR KNOWLEDGE OF SCIENCE AND CIVICS, AUGMENT THEIR STEM SKILLS, AND LEARN TO WORK IN TEAMS.

## BUILDING MULTILAYERED PARTNERSHIPS FOR CREATING EFFECTIVE GAME-BASED LEARNING ENVIRONMENTS AND WIDENING THEIR IMPACT

It is going to take a lot of games, in a lot of learning environments, affecting a lot of change to persuade the public policy establishment to commit to videogames as valid and effective learning tool. It will not be a quick process, and it will depend to a large extent on effective partnerships across the technology industry, the game industry, academia, philanthropy, government, education leaders, teachers, parents, and more stakeholders interested in advancing the use of games. Building effective multilayered stakeholder partnerships is thus a key issue for the viability of games for impact.

How does one create such partnerships? Simply by aligning each implementation of the game-making model with the educational focus of each potential partner's specific agenda—whether the focus is the partner's objective, the methodology used in the implementation, the profit motive, geographic location, or philanthropic purpose. The following provides a brief example of how to put partnerships together.

In the spring of 2007, then-Governor of West Virginia, Joe Manchin, was committed to economic development and both current and long-term job creation; specifically, Manchin saw that the state's traditional reliance on coal-mining was economically unsustainable, and that fresh paths to economic growth would need to be laid out. By the same token, the pet project of his wife, Gayle Manchin (an educator by background) was for the state to become an incubator of education innovation, and she issued an RFP to that effect. Both the Governor and the First Lady saw it as essential to provide education that could prepare their state's students to join the workforce of the global digital economy—an economy, as they saw it, in which digital creativity, game design, software engineering, and coding would need to become the basis for the new manufacturing, while such tasks as IT maintenance and customer service of wiki systems or custodial security of large databases would become the new "line" jobs. Both also saw that in the society driven by that digital economy, managers and policy leaders would mobilize employees and citizens with digital tools. The Governor and First Lady were

also committed to ending the state's brain drain and preparing their youth for jobs that could be virtual. Finally, there was no reason why the next Bill Gates or Steve Jobs couldn't be from rural West Virginia, and in 2012, he or she should be able to run a global tech company, or put together a startup with friends and stay right there at home to do so.

All of these missions were part of the West Virginia RFP when it landed in our inbox at the World Wide Workshop. So we shaped our Globaloria program to fit the RFP and shaped the First Lady's RFP to fit the Globaloria mission. It worked: The first partnership was born to bring Globaloria into five classrooms in rural West Virginia.

Meanwhile, a foundation mandated to advance educational development within West Virginia's borders wanted to find an educational innovation that could be scaled upward and outward for incremental impact. Aligning agendas created a three-part partnership: government, an entrepreneurial non-profit startup, and a private regional foundation.

In the next couple of years those partnerships created enough momentum to attract the state's leading center for professional development to join and facilitate our professional development summer programs. Then we all hooked up with two providers of communications services that sought to expand usage of their broadband capabilities in the state. Their business strategy was to connect schools to broadband Internet service as a way of potentially creating interest among homeowners to subscribe to their service; it was a business strategy that happened to mesh well with our educational/economic development/educator professional development agenda.

Then came more foundations. First, a national foundation, committed to nurturing the health of democracy by ensuring that citizens are informed and engaged, was interested in finding ways to use games for that mission. And a private foundation, headed by a former governor of the state, was committed to finding a cutting-edge educational innovation that could reform the entire school system. We partnered with all of them.

Individual donors followed, as did more corporations. An entertainment-industry foundation saw a chance to change public opinion about the use of videogames for learning—and to inspire kids to develop the technical and creative skills that will allow them to eventually join the growing gaming industry.

Then, the State's Department of Education sought a school reform that would encompass digital teaching and learning and would establish a digital curriculum for game design; the aim was to develop STEM knowledge and skills among teachers as well as among students not engaged in science and engineering. The Superintendent introduced us to the West Virginia State Board of Education and we received their support as well, which they track in the regular progress reports we provide to them.

Government, the public education system, tele-communications corporations, private and public philanthropy: *Each had its separate agenda, but providing quality education—specifically, to underserved kids—was the common theme.* The partnership model demonstrated how educational transformation through teaching game-making could advance the agenda of each partner. A model that can be replicated in other states and districts was established.

> **To become successful teachers of the digital learners in their classrooms, teachers must first become digital learners themselves by experiencing first-hand the learning they want to deliver.**

### HELPING TEACHERS CHANGE THE GAME IN THEIR CLASSROOMS: DIGITAL LEARNERS BECOME DIGITAL LEADERS

Great technology tools can change the way we live and work, but a tool is only as good as the mastery of the person wielding it. The scalpel can save lives, but only if the physician using it knows how and where to cut.

Similarly, educational games, digital tools, and game-making resources can be a great boon to the education of our young people, but only if teachers get the training and support relevant to the needs of their students and their schools. This is true whether the teacher is a novice or experienced, whatever the content expertise the teacher brings to bear, whatever his or her grade-level expertise, and whether or not the teacher has prior knowledge of technology and digital media.

For the vast majority of teachers today, education through game play and game-making is a new context for teaching. Therefore, to become successful teachers of the digital learners in their classrooms, teachers must first become digital learners themselves. They must become fluent in the new language of digital games—and that requires teaching the teachers and supporting their learning efforts across a range of their learning styles and needs.

That hasn't always happened in the education field, as we've seen with the integration of computers, smart-boards, and other digital software and technologies into classrooms across the country. Massive investment in such tools without the necessary training for the educators who were expected to use them left many questioning the validity of their learning impact. That is a pitfall we must avoid as we look to the future of digital learning through impact games in U.S. schools.

Our template is a phased methodology that trains teachers first in how to *do* Globaloria, and then in how to lead the learning of it—that is, to act as an instructor, guide, and resource to kids in the classroom. "We learned just like our students," as one teacher put it, attributing her digital confidence to our teachers-as-learners-first methodology. "My teaching with computers and all these digital tools became richer and deeper because the Globaloria

team prepared me and supported me and my fellow teachers in how to first take our own baby-steps of digital learning, through playing games and programming games, when we first started."

The formula is a simple one, and it is based in the recognition that teachers are learners too when introduced to new technological advances. They need to experience playing games, all kinds of games—educational, entertainment and social-issue games. They also need to experience designing and making games and working in teams. With time and guidance to collaborate with and learn from one another, with access to high-quality professional development opportunities, and with ongoing support from school and district leadership and from experts in the educational software and gaming companies, teachers can fully leverage the transformative power of digital learning through games. When they do, they can in turn help educate the next generation of creative impact-game designers.

### THE INNOVATION CHALLENGE: HOW TO GET IT STARTED AND HOW TO KEEP IT GOING—THROUGH GAMES

That innovation is an economic engine is a truth acknowledged and embraced at all points along the political and ideological spectrum. The challenge is to find ways to stimulate innovation, cultivate it and sustain it once it has sprouted. It is an urgent challenge: Right now, millions of jobs are going unfilled because the nation lacks employees skilled in inventive thinking, enterprising design and resourceful problem-solving; there are simply not enough creative juices flowing down the employment pipeline. And of course, this insufficiency of present innovation bodes ill for the future as well.

Government, industry, and the foundation community stand ready to support initiatives that can generate, nurture and channel innovation, and all do an excellent job of bringing inventions and discoveries to fruition. But unless we can nourish innovation at the source, such efforts, although important, will always be one step behind.

*Just what is the source of innovation?* The answer is both simple and obvious: *the mind*. The real innovation

challenge, therefore, is to find ways to prepare young minds, the sooner the better, to be the fertile soil in which ingenuity, invention and creativity can take root and grow vigorously. That means getting to the nation's students as early as possible and as often as conceivable—in schools and out—to equip them with the tools and capabilities that can both empower them and incline them to innovate.

*The reason to start them early?* Innovation needs to be as deep inside their minds as their native language, and learning it is like learning a language; You start with simple phrases, keep on practicing, and eventually become fluent—some even become eloquent.

Research in neuroscience and other fields that sheds light on the creative process and on breakthrough thinking suggest what those tools and capabilities are. We know that innovation happens not so much in a flash as through a sequence of problem-solving steps—numerous adjustments that flesh out an idea into a workable operation or marketable product. We know that the process typically requires knowing how to come up with lots of ideas, try each one and reject some. We also know that it works best through collaboration, as connections are made, analogies drawn, prototypes built that one mind alone would not otherwise have thought of.

Translating this knowledge into practical ways to stimulate and sustain innovation therefore means ensuring that all our students everywhere are repeatedly given opportunities to imagine, think up ideas, analyze, criticize, build models, play and learn collaboratively, thereby acquiring the capabilities they need through playful practice. And of course, since theirs is a technological age, they must also master the skills of digital literacy and acquire the knowledge needed to use the tools of social networking and computer programming effectively in the innovation process. In fact, these must somehow become second-nature to students if they are to participate as active and inventive citizens and and to qualify for the high-tech and game-making industries that will require this of them as workers in the future. Indeed, all the industries of the future—business, entertainment, and health care, as well as the educational and public sectors—will all require their workers to innovate and lead change.

## CODA

Developing games with an educational mission that can impact students to think and learn in new and exciting ways is a vital initiative. At the same time, we have found that the game-making process itself has the power to transform thinking and learning, by engaging young minds in new and stimulating ways and igniting a fire of innovation in our country. Teaching young people to be creators of games for impact—not just consumers—can empower them to be leaders of change in the global knowledge economy. This learning process also helps youth manage their own self-directed paths for success in college, career, and civic life. The World Wide Workshop, as a founder and driver in this movement, continues to build cross-sector partnerships that support innovative STEM and civic learning. We endeavor to provide the platform and required support for teachers and learners who wish to use game design to form a better community, nation, and world with games, as well as with their knowledge of collaborative, impactful game-making. •



GLOBALORIA TEACHES STUDENTS TO COME UP WITH MULTIPLE IDEAS THROUGH COLLABORATION, WHEREBY CONNECTIONS ARE MADE, ANALOGIES DRAWN, PROTOTYPES BUILT, THAT ONE MIND ALONE WOULD NOT OTHERWISE HAVE THOUGHT OF.



EDUCATORS ENSURE THAT STUDENTS THINK UP IDEAS, ANALYZE, CRITICIZE, AND BUILD MODELS TOGETHER, THEREBY ACQUIRING THE CAPABILITIES THEY NEED THROUGH PLAYFUL PRACTICE.

# INCREASING ACADEMIC PERFORMANCE, MEDIA LITERACY, AND BRIDGING DIGITAL DIVIDES: THE RESEARCH

## The Results Are In: Globaloria Improves Teaching and Learning Across the Country
## 8 Highlights from the Globaloria Research Network:

Independent research is a core component of the World Wide Workshop's mission. The process of researching the impact of Globaloria on teaching and learning is an innovation in its own right. Since 2006, researchers from across the country conducted studies on an array of cognitive, developmental, social, instructional, systemic, and cultural domains of knowledge. They have used a variety of methodologies, including controlled experimental designs, case studies, longitudinal studies and design-based research. These efforts inform the field of education reform and drive the enhancements of the Globaloria platform and its deployments nationwide in public schools, charter schools, after school programs, summer camps, and community colleges and universities. As Globaloria continues to expand, the pool of data and possibility for education research expands with it.

> ### Globaloria helps students and educators build critical skills and habits of mind.
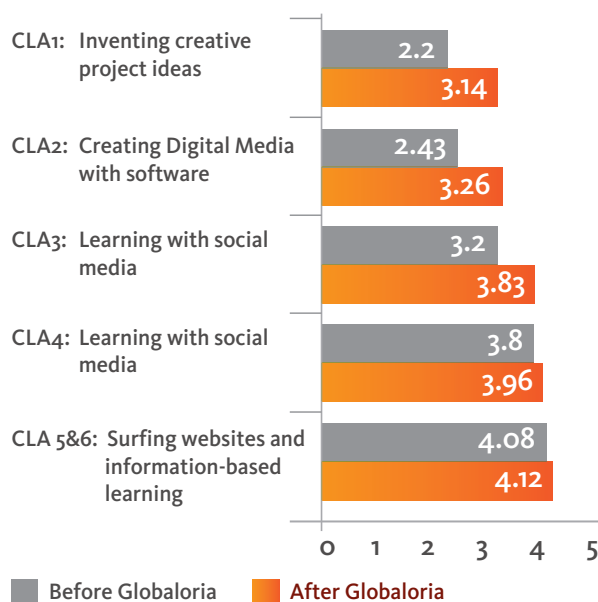>
> 1. Students report greater knowledge and motivation towards Contemporary Learning Abilities.
> 2. Globaloria creates the conditions for a shift toward self-directed and collaborative learning.
> 3. Teachers develop and implement new, transferable instructional styles and skills.

1. The six dimensions of student practice and expertise used as Globaloria learning objectives, or "Contemporary Learning Abilities" (CLAs), are critical for effective participation in our knowledge economy and digital culture. Over five years of research, Rebecca Reynolds of Rutgers University found that Globaloria consistently advances students' knowledge of and motivation toward all six CLAs, particularly in the invention, progression and completion of an original digital project, in project-based learning with networked tools and in the publishing and distribution of self-created digital media artifacts (see Figure 1 for example items and a list of the 6 CLAs).

2. For many students, Globaloria is their first experience in which the teacher or instructor does not always have the answers, resulting in a shift towards self-directed learning. Rockman et al, quoted one student noting that as compared to traditional instruction, it is "very different when you go up to a teacher and they say 'I don't know, try this.'" Rockman found that as a result, students work collaboratively to solve problems and expand their game-design skills on their own, in some cases taking it upon themselves to go well beyond the curriculum requirements.

### Figure 1: HS Students' Knowledge of Contemporary Learning Abilities

CLA1: Inventing creative project ideas
- Before Globaloria: 2.2
- After Globaloria: 3.14

CLA2: Creating Digital Media with software
- Before Globaloria: 2.43
- After Globaloria: 3.26

CLA3: Learning with social media
- Before Globaloria: 3.2
- After Globaloria: 3.83

CLA4: Learning with social media
- Before Globaloria: 3.8
- After Globaloria: 3.96

CLA 5&6: Surfing websites and information-based learning
- Before Globaloria: 4.08
- After Globaloria: 4.12

(Scale: 0 1 2 3 4 5)

■ Before Globaloria  ■ After Globaloria

3. Research conducted by Pamela Whitehouse of West Virginia University demonstrated the program's impact on teaching practices. Overall, educators believe they become better teachers as a result of their participation in Globaloria. They adapt their styles to reflect the Globaloria way of teaching and learning: self-led, collaborative, peer-to-peer, and expert-guided. Most encouragingly, educators implement their new styles and used innovative learning tools, like blogging, in both Globaloria and non-Globaloria classes, demonstrating the transferability of these skills.

4. Globaloria builds student interest in STEM careers and capacity to achieve in a technology-driven world.

5. Participation in Globaloria eliminates computer usage gaps among students, narrowing the digital divide.

6. Particular gains are found among girls, who enroll in Globaloria at a higher rate than the national average.

4. Laura Minnigerode, an Austin-based Program Evaluator who focuses specifically on low-income, minority English language learners, identified that Globaloria participation boosts students' technology-learning self-efficacy, skills like the ability to "put your thoughts and ideas into words that are easy for people to understand on your blog" and "search on the Internet to find help when you get stuck on something." The results shown in Figure 2 illustrate the magnitude of these gains and how they are compounded for 7th graders—and girls in particular—in their second year of Globaloria, attesting to the value of the multi-year practicum approach. This increase in skills corresponds to an increased interest in science, technology, engineering and math (STEM) careers, with the number of students who hold a STEM-related career goal shown to rise from 36 to 52 percent for students in their second year of Globaloria.

5. Alex Games of Michigan State University found that Globaloria positively impacts students' Computational Thinking (CT) skills, particularly in the problem decomposition and pattern recognition areas. Further research by Reynolds demonstrates the importance of these gains, finding that prior to participation, students with parents of above-average education reported increased home computer use, whereas after participation in Globaloria, parent education no longer significantly determines student computer use.

6. The strength of Globaloria as a program to engage and motivate girls in STEM learning is further underscored through research conducted by Catherine Ashcraft and her team at the National Center for Women & Information Technology (NCWIT) that found that girls enroll in Globaloria computing coursework at a higher rate than the national average, with 33 percent female enrollment in 2010-11 and 37 percent female enrollment in 2011-12. NCWIT researchers also found that Globaloria increases girls' participation in home computing activities such as making graphics, animation, games, digital music or video, programming and using online tutorials – an important achievement for an intensive computer science program.

### Figure 2: Gains in Technology-Learning Self-Efficacy
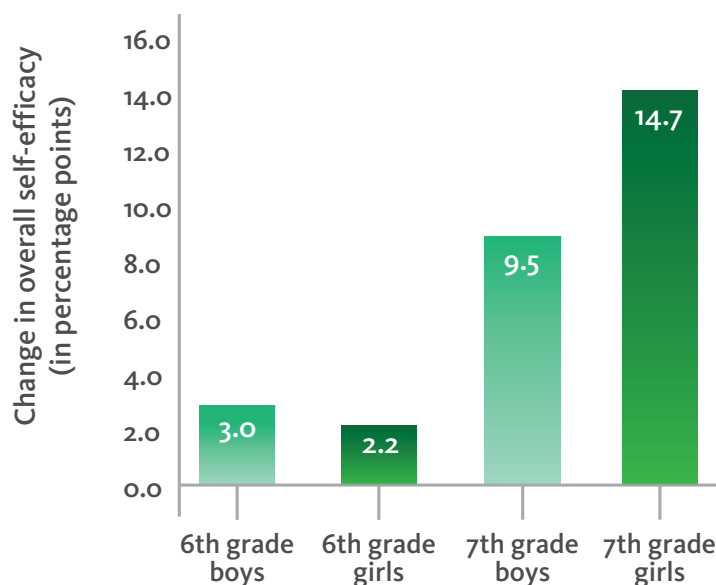


Globaloria boosts girls' interest in technology. Girls enroll in Globaloria computing coursework at a higher rate than the national average, with 33% female enrollment in 2010-11 and 37% in 2011-12. Globaloria participation increases girls' home computing activities, including making graphics, digital music, video, and using online tutorials.
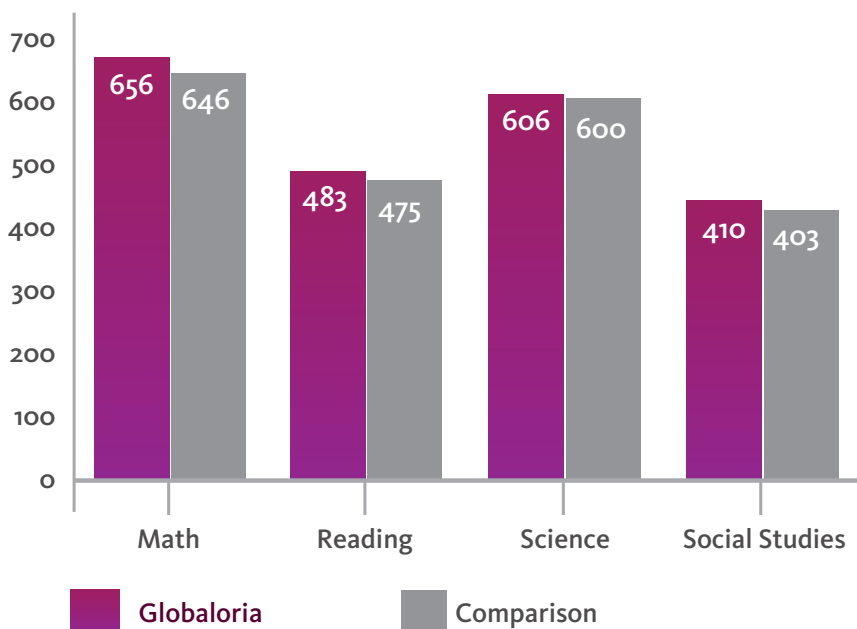
# Globaloria is linked to significant gains on standardized tests of math and reading.

7. Globaloria leads to increased performance on statewide assessments in West Virginia and Texas.

8. Significant gains are found among low-income students served by Globaloria programs in both states.

7. In three consecutive studies, researchers at Edvantia in Charleston, West Virginia, found that Globaloria students—drawn from some of the most impoverished counties in the state—outperform their peers on the West Virginia Educational Standards Test. Most recently, researchers found that these gains were statistically significant on the Math and Reading subtests. A comparison of unmatched mean results on the WESTEST2 can be seen in Figure 3.

8. Similar gains were identified in Minnigerode's research among low-income middle-school students in Texas, where 6th graders' Globaloria final course grades are significantly correlated with performance on math and reading objectives on the state TAKS tests.

**Figure 3: WESTEST2 Results**

| Subject | Globaloria | Comparison |
|---|---|---|
| Math | 656 | 646 |
| Reading | 483 | 475 |
| Science | 606 | 600 |
| Social Studies | 410 | 403 |

■ Globaloria   ■ Comparison

Globaloria increases students' academic performance. Students who participated in Globaloria scored significantly higher than non-Globaloria students on West Virginia's WESTEST2 in 2009 through 2011. Low-income, middle school students in Texas show statistically significant gains in critical reading, math achievement, and self-efficacy scores on standardized and unit tests.

Globaloria has a direct impact on students' computational thinking practices, particularly in problem decomposition and pattern recognition. Participation in Globaloria eliminates disparities in home computer use among students on the basis of parent education.

# Globaloria: Increasing Academic Performance & Bridging Digital Divides

Summary of research results from 2007-2012 studying over 7000 Globaloria students and 500 educators in 7 states across the nation

## Globaloria increases students' academic performance

- Students who participate in Globaloria score significantly higher than non-Globaloria students on West Virginia's WESTEST2 year after year (2009 through 2011)
- Globaloria students who use the network as part of a core curriculum class—for example, biology—score moderately higher than their non-Globaloria peers on five out of six academic assessment measures: three unit tests, course average, and course grade
- Low-income, middle school students in Texas show statistically significant gains in critical reading, math achievement, and self-efficacy scores on standardized and unit tests

(Dr. Doris Redfield & Dr. Kristine Chadwick, Edvantia, WV; Dr. Bobbi Nicholson, Marshall University, WV; Laura Minnigerode, World Wide Workshop, TX)

## Globaloria helps underserved students overcome digital barriers

- Globaloria helps students significantly increase their ability level in the three most Constructionist contemporary learning abilities, indicating mastery of digital literacy
- Globaloria has a direct impact on students' computational thinking practices, particularly in problem decomposition and pattern recognition
- Participation in Globaloria eliminates disparities in home computer use among students on the basis of parent education

(Dr. Alex Games, Michigan State University & Dr. Rebecca Reynolds, Rutgers University, NJ)

## Globaloria boosts girls' interest in technology

- Girls enroll in elective Globaloria coursework at a higher rate than the national average, with 33 percent female enrollment in 2010-11 and 37 percent female enrollment in 2011-12
- Globaloria participation increases girls' participation in home computing activities, including making graphics, animation, games, digital music or video, programming and using online tutorials

(Dr. Zhen Wu, Dr. Catherine Ashcraft & Dr. Wendy DuBow, National Center for Women & IT at the University of Colorado & Dr. Rebecca Reynolds, Rutgers University, NJ)

## Globaloria improves learning habits and behaviors

- Globaloria effectively promotes collaborative learning, with greater numbers of students working in teams; for example, 73 percent of all games are created collaboratively
- Globaloria students are developing new and expanded skills, including problem-solving, organizational and time management abilities, presentation, interpersonal skills, and collaborative processes
- Globaloria inspires students to consider STEM careers, increasing the number who identify STEM-related career goals from 36 to 52 percent of students in their second year of the program
- Researching, planning and designing games relating to civic topics using the Globaloria curriculum results in a more meaningful and lasting civically-minded connection than through traditional curricula

(Dr. Bobbi Nicholson, Marshall University, WV; Dr. Rebecca Reynolds, Rutgers University, NJ; Jennifer Borland, Rockman et al & Laura Minnigerode, World Wide Workshop, TX)

## Globaloria transforms teaching styles

- Overall, teachers believe they are better teachers as result of their participation in Globaloria
- Globaloria educators significantly change their styles to reflect the Globaloria way of teaching and learning: self-led learning, co-learning, peer-to-peer learning, expert-guided learning
- Globaloria educators develop their own digital literacy in ways that have far-reaching effects on their teaching decisions, attitudes towards students, and the habits of mind they are developing vis-à-vis their own practice
- Globaloria educators implement their changed teaching styles in both Globaloria and non-Globaloria classes, demonstrating the viral character of their new skills

(Dr. Pamela Whitehouse, WVU)

## Find out more at WorldWideWorkshop.org/reports

# MOTIVATING DEEPER STUDENT LEARNING:
# THE GLOBEYS DESIGN AWARDS

## THE GLOBEYS: Motivating Students to Dig Deeper into their Learning, While Developing Excellence in Game-Design, Programming, Content Knowledge, and Team Work

Every year, as part of their Globaloria courses, all students also participate in game design competitions called the Globeys. It is the culmination of their year-long learning and teaching activities. The Globeys celebrate excellence in game design process and collaborative team work, and motivate students to dig deeper into their learning—all while helping them to develop real-world skills. The Globeys are launched in the fall. Students work on their projects throughout the school year and submit their completed game projects to the competition in the spring. Certificates, prizes and awards—including laptops with Adobe Flash software, and Konami, Nintendo, EA, and Microsoft Xbox 360 videogames—are given to the winning teams at special Globey Awards Ceremonies. Each winning game is published on the Globaloria.org website, enabling visitors and aspiring young game designers to learn from and be inspired by students' original creative design work.



Silicon Valley student presents his game to the audience at the annual Globeys ceremony.

Student games are judged by a panel of distinguished judges on the following elements:

1) Technical quality
2) Production quality
3) Research quality
4) Educational content quality
5) Artwork and animation quality
6) Teamwork quality

Past judges have included Justice Sandra Day O'Connor (Honorary Chair); Senator John D. Rockefeller (Honorary Chair); Bob Buckhorn, Mayor, City of Tampa; and Jon Perera, VP of Worldwide Education Marketing, Adobe, among others (see page 62).

## Winning Games of the 2011-12 Globeys



Team The Gold Apple won the Texas Globeys with *Flood Escape,* a game about the danger of and safety protocols during floods.

Team Barcelona won the California Globeys with *Math Sports,* which teaches square roots by means of playing various sports games.

Team Milkapedia won the West Virginia Globeys in the Civics category with *Cause & Effect: The Daniel Caldwell Story,* about the problem of bullying online and in schools.

Team The Color Pink won the West Virginia Globeys in the STEM category with *Power Supply,* which challenges players to virtually build a computer.

Team Mathlodon won the Florida Globeys with their game of the same name, in which the player is a shark navigating the ocean by successfully solving math equations.

## Leadership Inspiration Awards: Recognizing Educators and School Leaders for Best Uses of Globaloria to Cultivate Change and Lead Education Excellence in Their Communities

The World Wide Workshop also recognizes the role models who are leaders of change in their organization, who inspire Globaloria students to achieve excellence and gain new knowledge that is relevant to the global knowledge economy. The annual Leadership Inspiration Awards and Educator Inspiration Awards are based on peer nominations and recognition for specific areas of achievement.

Principals and superintendents are eligible for Leadership Inspiration Awards based on their success in the areas of 1) Globaloria program leadership and advocacy, 2) recruiting educators to lead and students to join Globaloria classes, 3) creating more time for Globaloria classes in the school schedule, and 4) improving school technology infrastructure and connectivity.

In addition, all Globaloria educators, new and returning as well as program Mentors, are eligible for Educator Inspiration Awards in recognition of 1) leading an outstanding Globaloria integration in their classrooms, 2) demonstrating the power of digital learning, 3) active participation in the online Globaloria community, 4) following program curriculum, and 5) excellence in their own self-learning.



2012 Leadership Inspiration Awards presented to educators and education leaders by corporate sponsors (ESA), WV Department of Education, WV Center for Professional Development, and WV Board of Education, all of whom have helped pioneer Globaloria on the ground by engaging rural students each day in innovative STEM and Computing learning-by-doing.



California Educator Carlos Inda accepts the 2012 Educator Inspiration Award for "Best New Educator" category from Shannon Sullivan, Vice President of Programs and Production at the World Wide Workshop.

The mission of the World Wide Workshop is to support and celebrate education innovation that prepares educators and their students to be active participants in the global innovation economy.



Superintendents and principals who are Winners of the Annual Leadership Inspiration Awards in West Virginia are presented with a "Game-designer Kit" in recognition of their entrepreneurial and innovative spirit of integrating Globaloria successfully in their school systems.

See www.Globaloria.org/competitions

GLOBALORIA WV Globeys STEM
GLOBALORIA WV Globeys Civics
GLOBALORIA CA Globeys
GLOBALORIA TX Globeys
GLOBALORIA Educator Inspiration Awards
GLOBALORIA Inspiration Awards

# CONVERSATIONS WITH TEACHERS:
## REFLECTIONS ON TEACHING WITH GLOBALORIA

In the following interviews, three Globaloria educators tell about their teaching experiences and express views on their students' learning in the Globaloria environment.
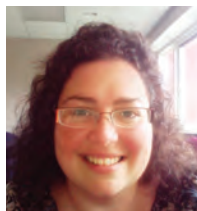
Introduction and reflections by Dr. Belinha De Abreu, media literacy educator, author, and member of NTC's Board of Directors.

**BELINHA DE ABREU, Ph.D.**
*Media Literacy Educator and Author*

**NYSSA ARCOS EVANS**
*6th & 7th grade Teacher, Austin, Texas.*
*East Austin College Prep's Globaloria Pilot Project*

**DENISE STALNAKER**
*Globaloria Pioneer Teacher.*
*National Director of Professional Development*

**OTIS ROBINSON**
*Biology/Science Teacher and former Lead Globaloria Educator, IS-364, Brooklyn, New York*

## THE QUESTIONS WE POSED:

- Tell us about who you are, what you teach, and what your role is in supporting Globaloria.
- What are you doing with the Globaloria Project in your school?
- How did you get involved with the Globaloria Program?
- How did you connect (fit) the project into your curriculum?
- What were your learning goals - in the domains of knowledge, skills, affect (or attitude)?
- How did you connect principles and skills of media literacy and new literacies?
- What challenges did you encounter putting it in place, managing it, completing it, etc?
- Are you committed to continue it? Can you replicate the program on your own? What do you need to keep it going?
- How has this program impacted the students' learning in the classroom?



### GLOBALORIA.ORG
**5 Interconnected Platforms**

| School Learning Platform | Globaloria Central Platform | Professional Development Platform | Learning Management Platform | Network Administration Platform |
|---|---|---|---|---|
| Digital textbook, step-by-step curriculum (150+hrs), social learning spaces, worksbooks, tutorials library, live help | Hub for all participating classes & schools to connect & share resources & projects | Private space for educators' training & learning, class management resources, tools, rubrics & teaching tips | Custom tools and reports to track & manage participant data, progress, & competitions submissions | Restricted access for Workshop Team to manage & monitor all systems for safe & secure, best overall member experience |

Globaloria Platform Architecture: Designed for Learning, Sharing, Teacher Training, and Managing

# Belinha De Abreu

## TEACHER CONNECTIONS WITH TECHNOLOGY

Belinha De Abreu Ph.D. is a Media Literacy Educator. Her work focuses on new literacies which encompasses media, visual, and information literacy. Dr. De Abreu holds a Ph.D. in Curriculum and Instruction with a focus on media literacy from the University of Connecticut. She is the author of *Media Literacy, Social Networking, and the Web 2.0 Environment for the K-12 Educator* and can be reached at deabreu1@juno.com.

With any new program that is introduced and integrated into a curriculum, there is always the question of whether it is an effective learning tool for the classroom. What do students learn? How do teachers manage the program? What are the foreseeable outcomes? In the case of Globaloria, it is one such program where the goal is to integrate both a platform and program to enhance/transform the classroom environment. In doing so it looks at who students are today and what can be done to motivate their creativity and thinking in a way that will communicate to not only the classroom, but also the outside world.

As testing has dominated the educational classroom, the development of thinking and learning has been fragmented in part by 'the test.' In order to process information in a world where new technologies are growing consistently, learning in the classroom needs to shift forward. For students, they find those creative thinking places outside of the classroom in technologies which are not approached in the classroom. Their lives are intricately embedded in the realization that their online worlds are greater and offer more potential for them to develop as individuals. As stated by Todd Finley in *Edutopia*,

> By forbidding the use of social media sites in 52% of our nation's classrooms, schools are suppressing a learning revolution that is characterized by several truths:

1) facility with social media tools is critical to learning and working in the 21st century; 2) 75% of online adolescents are already social networking outside of school; 3) many students hack through Internet filters during class; and 4) exploration of social media sites is part of the adolescent identity. Teachers might not value, use, or understand social media tools, but they need to. Not authorizing the use of these new tools will lead students to question teachers' relevance in helping teens negotiate the 21st century (Finley, 2011).

From mobile to social, students are deeply embedded in a 21st century mode of interacting whereas schools struggle to keep up regularly. The Globaloria program provides an opportunity to close that gap in technological and methodological learning by promoting a curriculum that carefully considers the user, the classroom, the teacher, and the worldwide community.

Part of the concept of this program is to create media games for learning and simulation. Following the idea that gaming is instructional and purposeful, Globaloria has created a program which considers the learner—the student, and the instructor—also a learner, trying to find ways to motivate learners in the classroom. Moreover, the gaming in itself has become a curricular discussion piece with the focus on what it actually teaches the user as he is processing, considering, and manipulating components to move forward throughout the game. A noted researcher in the area of gaming and learning, James Paul Gee, notes that there are several learning outcomes of good gaming. In his opinion students are taught the following: identity, interaction, production, risk taking, customization, agency, well-order problems, challenge and consolidation, "just in time" and "on demand," situated meanings, pleasant frustration, system thinking, exploration, lateral thinking, rethinking goals, smart tools and distributed knowledge, cross-functional teams, and performance before competence (Gee 2003, 2004, 2005). Many of these learning outcomes fall under the category of "play," which has an

important place in the school curriculum. Play and creativity are intertwined and are the most important part of the growth of any child. Furthermore, when students are engaged in play, their concentration deepens and their ability to accomplish increases (Axeline 1947).

Globaloria's learning process is reinforced and designed with the idea of play in mind and many of the points made by Gee. *The visual on the previous page* shows in detail the cycle of learning with the points of engagement specified.

What is most significant about the program's growth is how it reaches into technologies which are favored and most used by the students—social networking and development—which transforms the learner in the process. These experiences are eloquently expressed by the Globaloria teachers in these pages. Denise Stalnaker, a veteran of the first class pilot site in West Virginia, now the West Virginia State Manager, says, "This program has done different things for different students. Students who were never leaders become leaders. Students who never made presentations are doing great presentations. Students who never programmed are programming. Students are learning to be better presenters, coders, proofreaders, communicators, team workers, and the list can go on and on." This sentiment is shared by Otis Robinson, former lead teacher on this project at the Intermediate School 364 in Brooklyn, New York. "Globaloria provides an outlet where they can hone their talents, reflect and synthesize information. I noticed students used the blogging technology effectively through blogging often, and using hyperlinks. They also shared their personality on their wikis and blogs through the way they designed their sites." He furthermore indicated that he believed the Globaloria project could potentially spur entrepreneurship opportunities amongst the children because of its unique and innovative applications. The idea of entrepreneurship is one that has been promoted as part of the Partnership for 21st Century learning where they propose the idea of growth in business through innovation and the creative process which would lend itself to the business world.

As with any program that is implemented for the first time, there are always some obstacles to overcome. For those schools and communities involved with the implementation of the Globaloria program,

the biggest challenge faced by these teachers is time and students' attitude. Based on her experiences in implementing the evolving project, Denise Stalnaker reflects on the need for creative innovation, "Time is a big challenge for both managing and completing. School has so many requirements on both the teachers and students that it is hard to develop a full playing game. However the skills they learn are 'priceless' even if they don't complete the game. Changing student attitudes is another challenge. Students are so used to being 'spoon fed' that it is challenging to get them to search for answers and to try to figure things out. Some students try once or twice and at that point do not have the patience to continue looking or trying. We need to change that attitude."

The fact that a program such as Globaloria encourages individualized thinking certainly provides a positive spin on their curriculum. Most schools deal with curriculums that are preset and ideas which are designated or prescribed due to state testing. As Stalnaker mentions, the idea of motivating student thinking is fundamental to the growth of the 21st century student in today's working environment. The International Society for Education (ISTE) concurs that skills like these are most needed in the workplace. As was stated in an article published in *The Journal*, the skills that are needed for K-12 graduates are how to look at a problem, understand its components, consider solutions, and then implement the resolution (Gordon, 2011).

The results of the impact on student learning are just beginning to be seen and are unique to each individual participant. As more schools take up the call for creating innovative and creative classrooms of learning, Globaloria's program is sure to be considered by many other school districts. •

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# Nyssa Arcos Evans

**NYSSA:** The Globaloria program is based on the concept of learning through the use of media, so they're pretty much using different types of media to construct knowledge about the topic they want to focus their game on.

It's really a wide array of topics, ranging from science to math to social issues impacting their lives or those around them. This enables them the freedom to choose from a variety of media tools to research and learn about their focus topics. As they're using different tools, they're increasing their understanding about what types of media are appropriate for the information that they need to create: a game that's educational, non-biased and factual (i.e. so that they are not just making anything up. This is a very important lesson, because otherwise they could come up with some very inaccurate accounts on the topics or issues their games are addressing). The Globaloria curriculum includes a topic on teaching students how to create games that are not solely based on opinion or singular points of view. We used a video clip to show the "Single Story" from a TED conference to bring a real personal experience into the teaching of this lesson. The kids were better able to understand how powerful the implications of telling only one side of a story are on your audience. This is where media literacy becomes so important in the education of our students, because they would not otherwise understand the powerful message that their words and images can have when published for all to read and view.

I taught 7th grade last year and just started to teach 6th graders. In this first week I have noticed a very high degree of difference in the maturity of these younger students. They have not yet been taught; they come in without the
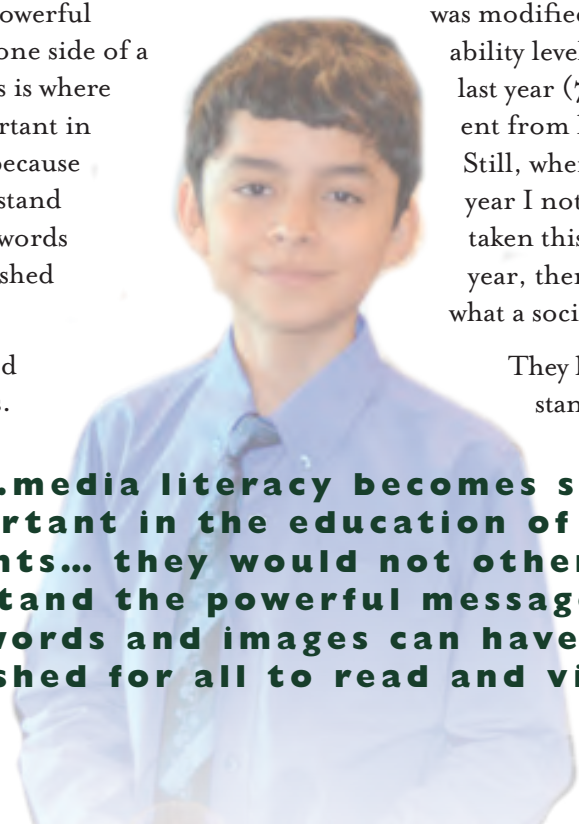
knowledge and understanding of how to direct the information. They are not yet sure of what message they are trying to convey through their games or even how to make a game that teaches others a certain skill or concept. It is also very difficult for them to grasp the idea that they will be creating something using these foreign media tools to a wider audience. They can not imagine whom they are targeting or what the end goal is until we have discussed a variety of media tools and how they can be effectively used to communicate ideas and concepts. By the time these students are 8th graders, they already know who their audience is, what they are trying to communicate, and it is much easier for them to identify what information is relevant to their point.

**MARIELI ROWE:** *How do you think the students arrive at this greater insight? Does this just happen through osmosis? Or do you as teacher deliberately teach the skills of deeper critical thinking, evaluation and media literacy basic concepts? Concepts such as media being constructions, representations of reality, and containing points of view, etc?*

**NYSSA:** It's a combination of having moved through the program over the past two years, using this same curriculum the entire time, with the only change being the topic they addressed, together with my adapting my teaching style. Obviously my teaching technique was modified to address the various student ability levels. And so, the way that I taught last year (7th grade into 8th) was very different from how I will teach the 6th graders. Still, when I began teaching Globaloria last year I noticed that even though they had taken this exact same course the previous year, there were still misconceptions about what a social issue really is.

They had a very narrow scope of understanding of what a social issue is, for instance that there are many more topics than the obvious ones of teen pregnancy or obesity which they had previously focused on the year before. I showed a number of documentaries and news clips that

**"…media literacy becomes so important in the education of our students… they would not otherwise understand the powerful message that their words and images can have when published for all to read and view."**

brought to light some issues they may have not previously thought about as pertinent to their lives. Because the 7th graders were going to take a state assessment in science the following year, I wanted the focus to be on science. We discussed issues affecting people all over the world such as pollution, climate change, deforestation, alternative resources, and conservation of natural resources.

At the beginning of the year I tried to teach the students how to ask questions through research and think critically about the meaning of a social issue. We did some deep thinking to really gain an understanding and ask themselves "What is a social issue?"; "How does it affect my life?" "Why should I care about it?"; "How can I create awareness?…"

I used a lot of film, video clips, and images to bring the real world into the classroom and make those abstract concepts come to life.

**Through Globaloria I tried to increase student awareness of the many uses of media, its influences on society , to understand how great a number of people can be touched by their words both near and far. Globaloria has allowed our students the opportunity to become creators of media themselves.**

Through Globaloria I tried to increase student awareness of the many uses of media, its influences on society , to understand how great a number of people can be touched by their words both near and far. Globaloria has allowed our students the opportunity to become creators of media themselves. They have become so media literate from utilizing and producing media that it has become second nature to them. Sometimes they take these talents and tools for granted.

Throughout the game design process, the students also learn how to use social media for positive and educational purposes. They practice their written communication skills through blogging and programming on the wiki. They also get to share their work on the Internet when they publish their masterpieces on the web.

**I have noticed that my students are more aware of the world around them.**

Regarding the bigger media literacy question, does the Globaloria Project affect HOW students understand various forms of media, I believe that it does: it makes them more aware of the world around them. I believe the class discussions we have and the research that the kids do during the game design process have a profound effect on their understanding of what they can learn from different types of media.

I have noticed that my students are more aware of the world around them. They sometimes comment about something they saw in the news, or read on the Internet, after having discussed it in class and I don't think they would notice, or take the time to learn more about that issue, or even think twice about it, if we hadn't brought it up in class beforehand…the experience makes them much more aware and knowledgeable than their peers. ●

# Denise Stalnaker
## A BEGINNING AND A JOURNEY

**Denise**: I was a Globaloria educator for three years. I was involved in the first class pilot site, and now I am the National Director of Professional Development. Previously, I was a Business Education teacher who taught Digital Imaging, Desktop Publishing, Web Design and Business Computer Applications for grades 9-12 at the Randolph Technical Center. The Globaloria curriculum fits into the type of courses I was already teaching.

Presently, Randolph Technical Center offers Game Design I and II on a block schedule. Game Design I is in the fall and Game Design II is in the spring. We have worked with the state to develop a career and technical "completer" area called Electronic Game Design. These two courses are part of requirements for that program. I believe, and wish, that every business student—indeed every student—were required to take this course because of the skills they would gain.

My classroom was the first pilot site in West Virginia to offer Globaloria as a class. It was so successful that it grew from there.

The skills learned are skills needed in today's job market. We need to prepare our students for that job market.

We want students to be prepared for higher education and for work environments. This course gives them many skills that they can take to higher education or to the job market:

- Problem solving, teamwork, and communication skills are just three of many skills the students learn through Globaloria.

- Students need to learn that just because it is on the Internet doesn't mean it is true. Teaching students to gather accurate resources is an important component of the program.



Globaloria team at Randolph Technical Center, one of the first West Virginia pilot sites for Globaloria in 2007.

- Time is a big challenge for both managing and completing a project. School has so many requirements for the teachers and students that it is hard to develop a full playing game. However the skills they learn are "priceless" even if they don't complete the game.

- Changing student attitudes is another challenge. Students are so used to being "spoon fed" that it is challenging to get them to search for answers and to try to figure things out. Some students try once or twice and at that point do not have the patience to continue looking or trying. We need to change that attitude.

We are committed to continuing the program, yet we cannot replicate the program on our own. There are too many issues to keep up with as technology changes. We need to keep the curriculum that is offered by Globaloria to continue.

[Reflecting on the impact of the Globaloria program on my students] "This is a really hard question for me to answer because it is so broad. This program has done different things for different students. Students who were never leaders become leaders. Students who never made presentations are doing great presentations. Students who never programmed are programming. Students are learning to be better presenters, coders, proofreaders, communicators, team players, and the list can go on and on."

> **My classroom was the first pilot site in West Virginia to offer Globaloria as a class for course credit and a grade in high school. It was so successful that it grew from there… and I grew with it!**

**Marieli Rowe:** *In a follow-up telephone interview reflecting specifically on the deeper impact of the Globaloria project as a vehicle toward developing media literacy skills and insights, Denise defined and elaborated on the ways in which this can happen through the "eyes" of the new media environment and through the project's game design activities.*

**Denise:** I think media literacy is anything you can hear or see on different types of media; students typically go for the web-based media, they are very innovative with media on the web. That's where they get the source of their information. It places them in that new media world as accessible; they're learning blogs… they're blogging, reflecting on what they're learning. Then, there are questions on wiki lessons asking them to reflect about their learning. They are improving their blogging skills while reflecting on their progress. They're also learning to do "rich" blogs, doing video posts, and adding links to blogs. And then they're asked to create wiki pages, to design them, and post those lessons in their work. The advantage of this over traditional teaching and learning is,
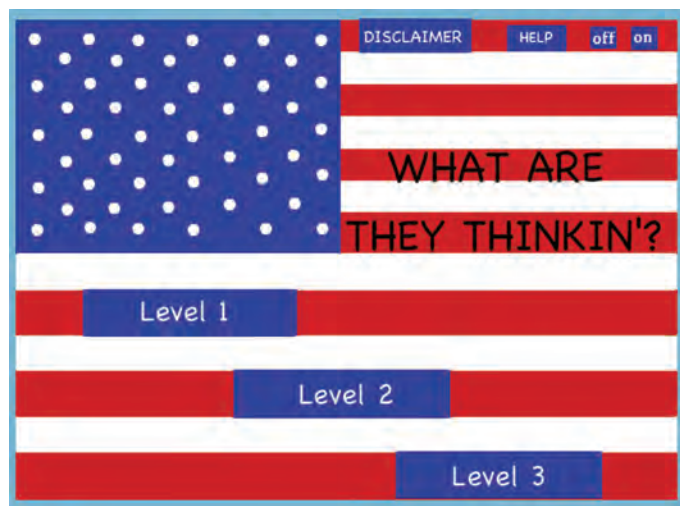
I think, that it's more interesting to the student. This is how they communicate. It's more interesting to do a blog-post than to write a paragraph on a piece of paper.

Now that I am the national director, that broadens my role and I am also involved with people who are teaching English or math. It is different but it is also still within my field because it is working collaboratively with these educators and I think, in education, we need to do that a lot. Addressing the question of whether—and how—the Globaloria project connects and incorporates the deeper concepts of media literacy in its learning goals, I think one thing I can add is in the use of the wiki and posting the students' work. That skill alone carries over to different things. We have incorporated some specific lessons that address this on the wiki, and I think this is what you mean: One of them is a video on the dangers of the "single story." It encourages the students to do research and to see multiple angles of one story and build it into the curriculum so that it makes the student aware. This lesson of the "single story" is part of a larger unit called "Join the Community." There is a video that teaches about different aspects:

> **Students need to learn that just because it is on the Internet doesn't mean it is true.**

- **JOIN THE COMMUNITY** addresses dangers of a single story, goes over community participation guidelines, e.g., using personal information, showing your work in different aspects, being respectful, using classroom etiquette, etc. It asks the students to blog about what a single story means, and what it makes them think about it. It asks for examples of a "single story" they may have heard about in their community and what they learned from that.
- **CHOOSING A TOPIC** where the students start their research, is another important lesson that has been used since the beginning of Globaloria in 2006. It teaches them about searches, how to do



**A GAME CREATED AND PRODUCED BY STUDENTS IN THE GLOBALORIA CIVICS TRACK CHAIRED BY SANDRA DAY O'CONNOR OF iCIVICS.**

meta-searches, and it has them document data, such as the name of the website, the article title, the authors, the source, so that they are thinking not only about what the information is but *where* it came from. And it has this report's date, when it was created, so that they are using relevant, dated, and documented material that has been fact-found. They have to find sites that list that information so they're not just going to read the sites and call it research. We're asking them to look at who wrote it. Its purpose is to teach about reliable resources.

As to the question of how "Audience" is addressed, that is discussed and we've made some recent changes. Every kid is designing a game for his or her grade-level. So the content should be **on** grade level. For example, a senior in high school cannot do a multiplication game that is about "2x2". They have to create a high-school level game. In math, they could do Algebra 1. We worked on emphasizing this focus for two reasons: first to make sure that the student would be learning content in the process of creating the game and secondly, so that they would be forced to identify a true and relevant audience, that this isn't a game for just anyone.

A very important part of the Globaloria project involves teacher training, which is an intensive four-day training program. During the first two days, educators are taking the training as a student. They go through the curriculum at a very fast pace so that they can experience the curriculum themselves. (During this part, they identify who their audience is and what they are going to teach.) They actually do these lessons; they watch the video of the "single story" and all the other lessons. And then the second two days of training are about how to teach the course and manage the curriculum as an educator, and this includes media literacy elements. They also identify their audience, and what they plan to teach, and go through one other lesson in which they develop their "demo."

And finally, to speak to the question of how we may know that the students are becoming media literate. It's a tough question… how do you prove that a person is educated? …when students begin with one point of view… or even when they come in with no knowledge of a subject, or they come in with a one-sided view, they do research and they put their research into that game. If it shows both sides or even one strong opinion, to me that's evidence they are evaluating all the media and also that they put reliable sources into their game. We had an individual that didn't put reliable sources and we talked to that individual; that was a learning experience and a great discussion for that student.

Globaloria is a great program. In some English classes, they'll take kids to the computer lab and they'll do research. But I don't think there is a lot of discussion about reliable resources and complex multi-dimensional learning. I think this program does a good job of building these things in. •
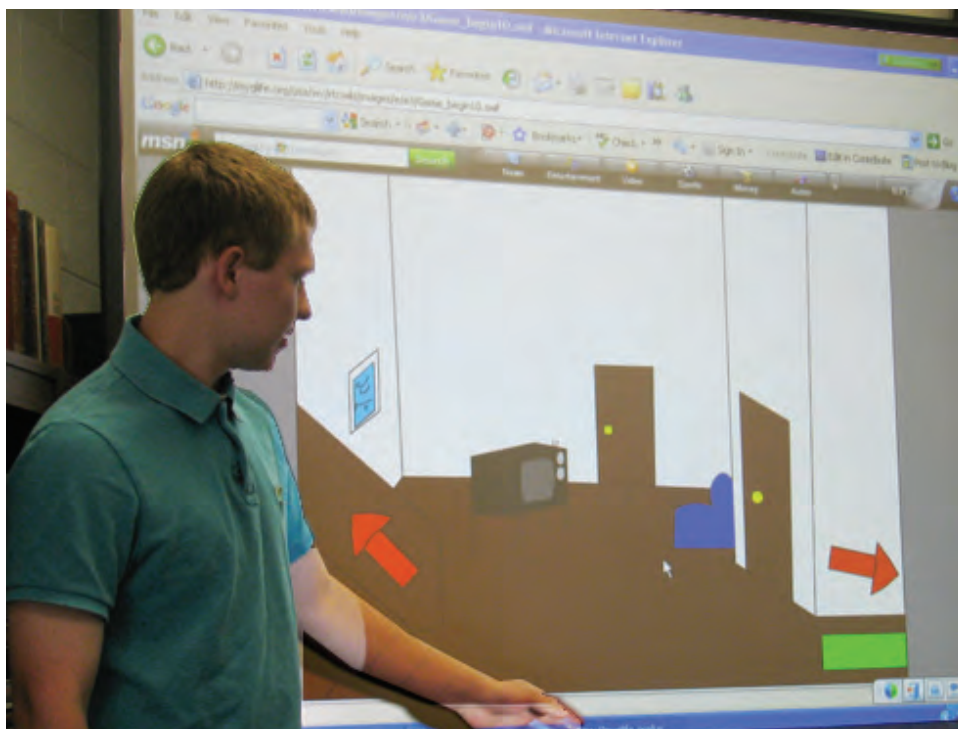


COMMUNICATION AND PRESENTATION SKILLS ARE JUST SOME OF MANY SKILLS THE STUDENTS LEARN THROUGH GLOBALORIA.

# Otis Robinson

## "I noticed consciousness growing in my students."

As the Lead Globaloria Educator at Intermediate School 364 in Brooklyn, New York, I did a pilot project with 30 students. Our class was in the science knowledge community with a focus on civics. We were focusing on two broad topics of nutrition and childhood obesity. The general question we addressed was "How can we make healthy food choices to prevent childhood obesity?"

We were creating discourse through our blogs and wikis about nutrition and making healthy food choices to prevent childhood obesity. We had class discussions in which student questions helped to drive our instruction about nutrition. One student asked the question "Is fat bad?" That led me into a lesson about unsaturated and saturated fats. We planned to do more nutrition information technology projects where students made video games about the concepts they had learned.

I had seen some of the amazing life science video games that Capital High School Globaloria science educator Bill Dorsey's students produced. His students made games on the properties of water in which they discussed pH, molecular structure, surface tension, adhesion and cohesion, and the states of water. The potential that students have to learn science and technology in an interdisciplinary manner was inspiring. The students have shown that they are also gaining multiple literacies at the same time through their work on blog and wiki assignments.

As a New York State Certified Biology teacher with a license to teach 7-12 graders, I designed our class project on nutrition to match the New York Living Environment Standards:

- 5.2b: Foods contain a variety of substances, which include carbohydrates, fats, vitamins, proteins, minerals, and water.

- 5.2e: In order to maintain a balanced state, all organisms have a minimum daily intake of each type of nutrient based on species, size, age, sex, activity, etc.

My learning goals were for students to become more *Flash*-literate, and improve reading and writing literacies through answering questions with complete sentences, and to improve their science knowledge in the field of nutrition. I also encouraged professional and responsible use of social media, information technology, and Adobe Flash in videogame design.

The Globaloria platform and curriculum is excellent for attaining knowledge about the principles and skills of media literacy and new literacies. As students continued to blog about carbohydrates and the importance of eating a well-balanced meal, I noticed consciousness growing in my students as we progressed in our research and narrowed the scope of our projects. Students used their blogs to discuss obesity, describe the three types of carbohydrates and list different fibers. We also briefly described the nutrient fat and its role in our body. I think for me the new literacy I was connecting was my understanding



of the positive impact that peer to peer, scholarly communication was having on my students as they reflected on their healthy and unhealthy eating habits.

On a personal level, I had to review my teaching pedagogy and reflect upon the presentation of information and cooperative learning among the students to ensure that the program would run smoothly.

Being a Globaloria Lead Educator was a role I valued highly. The opportunity to participate in this pilot project to enrich education with this cutting-edge technology was a dream come true. With adequate funding, Globaloria can expand and be replicated in other districts and schools.

The students seemed to love participating in Globaloria. The program provided an outlet where they could hone their talents, reflect and synthesize information. I noticed students used the blogging technology effectively through blogging more often, and by using hyperlinks. They also shared their personality on their wikis and blogs through the way they designed their sites. Globaloria should also be expanded to enhance learning in history, mathematics, foreign language, art, and other subjects. My particular class was graduating so they could most likely take this experience into high school, college and the workforce. This could spur potential entrepreneurial opportunities amongst the children. •

# REVIEWS BY MEDIA LITERACY EDUCATORS:

## Reflections at the Observer Level

Neil Andersen is a life-long Canadian teacher, mentor and pioneer in media literacy education who has taught film and/or media studies for over thirty years. A recipient of the Jessie McCanse Award, Andersen has taught at the University of Toronto, York University and at Mount Saint Vincent University. He is president of the Association for Media Literacy (aml.ca), on the Education Committee of the Media-Awareness Network (media-awareness. ca) and a member of the Journal of Media Literacy Editorial Board. Neil can be contacted at mediacy@sympatico.ca

## Neil Andersen

Globaloria is a program of the World Wide Workshop Foundation and is a terrific example of student-centered, Constructionism-supporting-Constructivism education. (See box for a brief discussion of Constructivism and Constructionism.) It involves students in game production in a very useful way because the games' content is a portion of the learning. Like peer teaching, of which Globaloria's game building is a new-media version, students must learn and understand knowledge before they can communicate it. Other important benefits of the project include technological learning and reflection. Many educators are justifiably concerned that students execute activities without awareness of their purposes, with the result that significant learning opportunities are wasted. Globaloria addresses this concern by including student reflection (blogs) in its processes, helping students to understand and appreciate the purposes of their games and of their technological learning.

The Globaloria activities I witnessed come from West Virginia, a state with established and relevant media literacy standards. A 5th grade standard directs students to "create an age-appropriate media product that demonstrates format, purpose, and audience." The grade 11 standard adds to these demands with "plan, compose, produce, and evaluate an age appropriate product from various forms of media communication that demonstrates an understanding of format, purpose, audience, and choice of medium." (www.frankwbaker.com/wvirginia.htm)

As the Globaloria programs deservedly grow in popularity and sophistication, spreading to many more jurisdictions and subject foci, I hope that the blog activities will include guidelines that might focus students' thoughts at a more sophisticated level of media literacy.

Specifically, I hope that the games and the students' blogs will reveal a greater awareness of target audience. Prompts that teachers might use to achieve this awareness include: What are the ages, abilities, and ideological positions of the people you want to play your game? How have you made design decisions based on this knowledge? What do you want players to learn? How do you hope playing the games will influence players?

These are essential questions for professional game designers, or for people who have created advocacy games, like the McDonalds videogame (www.mcvideogame.com), which was created specifically to advocate against McDonalds' corporate behaviors and is a great example of new media civic action.

I also hope that blogs might help students be aware of their games' values messages. Prompts that might help bloggers address values issues in their games include:
- What values messages does your game communicate?
- What are the possible ideological positions of the people who play the game?
- Are you speaking to an audience that is similar to or different from you (e.g., are your intended players like you or very different from you)?
- Who might take offense from the values messages in your game?
- Why?
- How might you revise your game to avoid offending players?

The production of media texts—in Globaloria's case, educational games—is a powerful and compelling way for students to learn a range of essential 21st Century skills that extend beyond media literacy. But all media production needs to include an awareness of the purposes and potential reception/uses of the texts. It is so easy to get immersed in the fun and complexities of production that audience and value issues fall victim. It is educators' challenge to keep these on the agenda, as they are a significant aspect of what students need to know and appreciate about 21st Century communications. ●

**Constructivism is a learning process which allows a student to experience an environment first-hand, thereby giving the student reliable, trust-worthy knowledge. The student is required to act upon the environment to both acquire and build new knowledge. Seymour Papert defined Constructionism as a mnemonic for two aspects of the theory of science education. From Constructivist theories of psychology we take a view of learning as a reconstruction rather than as a transmission of knowledge. "Then we extend the idea of manipulative materials to the idea that learning is most effective when part of an activity the learner experiences is constructing a meaningful product." (Wikipedia) Therefore, Globaloria promotes Constructivism because it facilitates Constructionism, specifically game production. Production of other media products, e.g., tweets, photos, blog posts, videos, web pages, etc. can provide the same quality of learning support when accompanied by appropriate reflections and prompts. Constructionism—the production of a product—is one of many ways to support Constructivism— the production of an internal model of how the world works.**

# The Game of Education Reform

## By Karen Ambrosh and Kate Vannoy

Karen Ambrosh is the English, Journalism, and Speech Teacher at Audubon Technology and Communication Center High School, a small charter school within Milwaukee Public Schools. She has her masters in Journalism and Mass Communication from UW-Milwaukee and is President of the National Telemedia Council. At Audubon, Karen directs theater programs, manages the school's media productions, and teaches courses in media literacy.

Kate Vannoy is the Instructional Technology Co-ordinator & Art Teacher at Audubon Technology and Communication Center High School. She has her doctorate in Instructional Design for Online Learning from Capella University. Kate has transformed her art room into an online learning laboratory, offering her students a wide range of courses including AP Art History, Multicultural Art, Graphic Design, Animation, and Independent Art Studio in which students are able to design their own learning experiences.

As public school teachers in a small charter school trying to build an innovative program within a large, traditional educational system, we and our colleagues often feel as if we are trying to build a SIM-City or play Dance Dance Revolution inside of an 8-bit Mario world. We end up spending too much of our energy trying to fit our self-paced, personalized, project-based model of learning into a standardized, graded, bell-scheduled, top-down managed system. Despite the challenges, we shimmy and wiggle, finding ways to move toward a more authentic learning environment.

Audubon High School opened four years ago with a one-to-one Mac laptop program. Two years in, with a successful media-rich, smooth operation, a decision was made at the district level to trade the Mac Books for Dells and the staff was forced to look for new ways to create. Many staff members, who were fearless and relaxed with technology in the classroom, suddenly felt apprehensive and uncomfortable changing the programs, methods, and assessments of our craft. Here we are, only two years later, and again, we are shifting from Dells to iPads, which are considered consumption devices, no cursors, or keys, but touch screens and apps. New programs and tools will change the way students interact with content and produce assessments and artifacts. As teachers willing to shift in these ever-changing environments, we will remain steadfast in our principles of authenticity.

On a larger scale, Globaloria is experiencing much the same, but they have figured out how to transcend the limitations of the institutions they work within and focus on what they have defined as crucial for learning. They have created a system of support for teachers and students to engage in DIY learning while still living inside the walls of a traditional school with all of its familiar bells, checkboxes of standards, forms, and expectations. Allowing students to invent and create simulations immerses them in deeper thinking about concepts learned in all subject areas. Globaloria's model of team project management moves beyond the simple models of cooperative learning of the past, creating forced assigned roles of recorder, timekeeper, and runner in each group. They have created a virtually connected community of learners with both teachers and students, strong mentorship from professionals and technology support personnel, and a solid platform of creativity and critical thinking built into the content. They have given the teachers the confidence to let go of the traditions of the classroom dynamics. The goal of media literacy is to give students the power to be critical consumers because they have learned what it takes to be a producer and know how to manipulate the rules, laws, and structure of media systems. They have created an opportunity for students to be re-trained to freely use their creativity and to question the rules of the educational game they have been playing for so many of their formative years.

As classroom teachers trying to build our small school of reform, we appreciate what the creators, collaborators, and educators working within the Globaloria Project have accomplished. They have an ambitious goal of replicating their program on a large scale which means they are fighting the hardest level of any game, finding a way to break down the barriers of the education game world itself. •

# COMPARATIVE TABLES OF SKILLS & ABILITIES IN MEDIA EDUCATION

## INTRODUCTION BY NEIL ANDERSEN

PRESIDENT OF ONTARIO CANADA'S ASSOCIATION FOR MEDIA LITERACY

There are many teams working to meet the challenges posed by the evolving 21st century media environment. That is a good thing. While each team may be using slightly different language and strategies, each is working to support students as they become the parents, workers and citizens who must propel us through the first half of the century. Current high school grads will begin retiring mid-century. O brave new world, what people will be in't? And what skills will they employ?

Media literacy educators are working hard to keep pace with increasingly easier, cheaper and accessible production tools and distribution channels. It is a constant challenge to understand and harness the power of new innovations for educational benefit. Audiences have become prosumers; microcasting abounds; wireless and remixing is ubiquitous.

One common feature among members of the media literacy education community is the use of a framework, a device used to help present, guide and assess media literacy learning. Marshall McLuhan proclaimed pattern recognition as an essential skill in an information-saturated environment, and his observation is truer now than ever. But pattern recognition of what? That is what the frameworks identify for students, each in their own idiosyncratic way, each revealing the biases of their creators. The following pages present three of the many frameworks in current use, one from Globaloria, one from the New Media Literacies Project and one from Ontario's Association for Media Literacy. There are others, among them the Scottish Media Literacy Triangle (www.mssolomon.com/node/11), the four concepts in UNESCO's Media Education Kit (unesdoc.unesco.org/images/0014/001492/149278e.pdf) and the National Association for Media Literacy Education's Core Principles of Media Literacy Education (http://namle.net/publications/core-principles/).

Globaloria's Learning Abilities reflect its mandate to support disadvantaged students as they become full-fledged citizens and producers in the knowledge economy. They strike a balance between effective knowledge workers and effective citizens. This is very good news for pundits who worry that the new media environment is an entertaining distraction from civic engagement. Research indicates that people engaged in new media activities are usually more engaged in civic actions, and Globaloria's Contemporary Learning Abilities are capitalizing on this synergy.

Project New Media Literacies' skills presents a different perspective, one that describes how users can thoughtfully and purposefully employ new media skills to become more effective communicators and navigators in the expanding mediascape. It describes how people can develop skills to improve their engagement and effectiveness in the networked culture. A hallmark of these skills is the notion of multiples: identities, perspectives and abilities. The Project New Media Literacies' image of the 21st century learner is someone aware, astute, proactive and nimble.

The Association for Media Literacy's Key Concepts shift the perspective significantly. Rather than describing the skills needed to succeed, the Key Concepts articulate notions that need attention and reflection as students navigate the media environment. The Key Concepts provide a very useful complement to the skills descriptions because they help teachers and students to consider first questions, i.e., before we examine how and why we might use tweets, we need to determine what tweets are and how they fit into and interact with the multi-platform environment.

Rather than competing with one another, the frameworks form a suite of ideas whose similarities and differences can help teachers reflect upon and assess the effectiveness of their lessons or syllabi. Each is a set that, when compared and contrasted to its mates, informs the others and builds more effective learning activities. Teachers should know them all comprehensively, and cherry pick from among them to build learning opportunities that will meet the needs of their curriculum and students. ●

**SEE COMPARATIVE TABLES ON THE FOLLOWING TWO PAGES...**

# COMPARATIVE TABLES OF SKILLS

## THE SIX CONTEMPORARY LEARNING ABILITIES FROM GLOBALORIA: DEVELOPING COLLEGE-READY AND CAREER SKILLS

| Abilities Set 1 | Invention, progression, completion of an original project, ability to program an educational game, wiki or interactive simulation |
| --- | --- |
| Abilities Set 2 | Project-based learning in Web2.0 environments, and processing complex project management (programmable wiki systems) |
| Abilities Set 3 | Producing media, programming, publishing, and distributing interactive purposeful digital media in social networks |
| Abilities Set 4 | Social learning, active participation, public expression and exchange |
| Abilities Set 5 | Information-based learning, search, and purposeful exploration and discovery |
| Abilities Set 6 | Thoughtful surfing of websites and new web 2.0 applications |

## THE NEW MEDIA LITERACIES: SKILLS NEEDED FOR ENGAGEMENT IN TODAY'S PARTICIPATORY CULTURE

| Play | The capacity to experiment with one's surroundings as a form of problem-solving |
| --- | --- |
| Performance | The ability to adopt alternative identities for the purpose of improvisation and discovery |
| Simulation | The ability to interpret and construct dynamic models of real-world processes |
| Appropriation | The ability to meaningfully sample and remix media content |
| multitasking | The ability to scan one's environment and shift focus as needed to salient details |
| Distributed cognition | The ability to interact meaningfully with tools that expand mental capacities |
| Collective intelligence | The ability to pool knowledge and compare notes with others toward a common goal |
| Judgement | The ability to evaluate the reliability and credibility of different information sources |
| Transmedia navigation | The ability to follow the flow of stories and information across multiple modalities |
| Networking | The ability to search for, synthesize, and disseminate information |
| Negotiation | The ability to travel across diverse communities, discerning and respecting multiple perspectives, and grasping and following alternative norms |
| Visualization | The ability to interpret and create data representations for the purposes of expressing ideas, finding patterns, and identifying trends |

Source: Henry Jenkins, with Ravi Purushotma, Katherine Clinton, Margaret Weigel, and Alice J. Robison, *Project New Media Literacies*.

## CANADA'S 1989 EIGHT KEY CONCEPTS FOR MEDIA LITERACY

| 1. All media are construction | The media do not present simple reflections of external reality. Rather, they present carefully crafted constructions that reflect many decisions and result from many determining factors. Media Literacy works towards deconstructing these constructions, taking them apart to show how they are made. |
|---|---|
| 2. The media construct reality | The media are responsible for the majority of the observations and experiences from which we build up our personal understandings of the world and how it works. Much of our view of reality is based on media messages that have been pre-constructed and have attitudes, interpretations and conclusions already built in. The media, to a great extent, give us our sense of reality. |
| 3. Audiences negotiate meaning in the media | The media provide us with much of the material upon which we build our picture of reality, and we all "negotiate" meaning according to individual factors: personal needs and anxieties, the pleasures or troubles of the day, racial and sexual attitudes, family and cultural background, and so forth. |
| 4. Media have commercial implications | Media Literacy aims to encourage an awareness of how the media are influenced by commercial considerations, and how these affect content, technique and distribution. Most media production is a business, and must therefore make a profit. Questions of ownership and control are central: a relatively small number of individuals control what we watch, read and hear in the media. |
| 5. Media contain ideological and value messages | All media products are advertising, in some sense, in that they proclaim values and ways of life. Explicitly or implicitly, the mainstream media convey ideological messages about such issues as the nature of the good life, the virtue of consumerism, the role of women, the acceptance of authority, and unquestioning patriotism. |
| 6. Media have social and political implications | The media have great influence on politics and on forming social change. Television can greatly influence the election of a national leader on the basis of image. The media involve us in concerns such as civil rights issues, famines in Africa, and the AIDS epidemic. They give us an intimate sense of national issues and global concerns, so that we become citizens of Marshall McLuhan's "Global Village." |
| 7. Form and content are closely related in the media | As Marshall McLuhan noted, each medium has its own grammar and codifies reality in its own particular way. Different media will report the same event, but create different impressions and messages. |
| 8. Each medium has a unique aesthetic form | Just as we notice the pleasing rhythms of certain pieces of poetry or prose, so we ought to be able to enjoy the pleasing forms and effects of the different media. |

Source: John Pungente, S.J. From Barry Duncan et al. *Media Literacy Resource Guide*, Ontario Ministry of Education, Toronto, ON. Canada, 1989.

**Under revision in the evolving New Media Classroom 2.0 environment, the following is a draft update of Canada's Association for Media Literacy's 1989 key concepts for media literacy**

| | |
|---|---|
| 1. All media messages are constructions. | 5. Each person interprets messages differently. |
| 2. Media messages construct versions of reality. | 6. Media messages contain ideological and value messages. |
| 3. Each medium has a unique language, techniques, codes, conventions, and aesthetics. | 7. Media messages have social and political implications. |
| 4. Form and content are closely related in media messages. | 8. Media messages have financial implications. |

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# The World Wide Workshop Team of Experts

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**Amber Oliver,** Vice President, Partnerships and Operation

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**Debbie Super,** Director, Partnerships and Operations

**Denise Stalnaker,** Director, Professional Development

**Shubha Tuljapurkar,** Director, Globaloria in Silicon Valley

**Kara Burritt,** Manager, Programs and Communications

**Iba Dawson,** Manager, Programs and Production

**Yasmin Safdie,** Manager, Programs

**Charlie Owen,** Manager, Globaloria in Texas

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**Alessandro La Porta,** Coordinator, Programs and Production

**Jonathan Hodrick,** Game Design Support Specialist

**Ernesto Santos,** Senior Information/Database Developer

**Brian Judy,** Senior Game-Design Curriculum Developer

**Jon Hunter,** Web, Wiki and Database Developer

**Rich Goehl,** Art Director and Lead Designer

**Grant Noel,** Graphic and Video Designer

**Jaime Posa,** Coordinator, Special Projects

**Julie Newport,** Writer and Communication Strategy Expert

**Terri Ferinde Dunham,** Writer and Communication Strategy Expert

**Jennifer Cotter,** Writer and Communication Strategy Expert

**Katherine Ward,** Grant Development Support

**Andrew Watson,** Videographer and Editor

**Susanna Margolis,** Writer and Editor

**Frittz Badilla,** Administrative Assistant and Bookkeeper

**Daniel Ron,** Training and Technology Assistant

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**Dr. Cindy E. Hmelo-Silver**, Professor of Educational Psychology, Rutgers University, NJ

**Dr. Yasmin Kafai**, Professor of Learning Sciences, University of Pennsylvania Graduate School of Education

**Luke Kane**, PhD Candidate, University of Wisconsin-Madison

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**Laura Minnigerode**, EdM., Research Manager, Globaloria at EAPrep, Austin, TX

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**Raymond Rose**, M.Ed, Assistant Professor for Instructional Technology, Huston-Tillotson University, TX

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For more information, see: *www.worldwideworkshop.org/team* and *www.worldwideworkshop.org/reports*

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# 2012 GLOBEY AWARD JUDGES

The World Wide Workshop is grateful to the dozens of educational and business leaders that have lent time and energy to advancing STEM education and student innovation by judging student's original video game design entries to the Globey Awards—the culminating activity of each year of the Globaloria program.

## West Virginia STEM Globey Awards Competition

**Honorary Chair: Senator John D. Rockefeller**
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## East Austin College Prep, Texas Globey Awards

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**Office of Mark Strama**, Texas House of Representatives

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**Dana Fraticelli**, Chief Executive Officer, Boys & Girls Clubs of Silicon Valley
**Jon Perera**, Vice President of Worldwide Education Marketing, Adobe

## Hillsborough County, Florida Globey Awards

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**Anthonette Carregal**, Director of Education, Museum of Science & Industry
**Kathy Castor**, US Representative (FL), District 11
**Ben Herman**, College of Education, University of South Florida
**Wit Ostrenko**, President/CEO, Museum of Science & Industry
**Larry Plank**, Director, K-12 STEM Education, Hillsborough County Public Schools
**Mark Sharpe**, Hillsborough County Commissioner, District 7

For more information, see: *www.worldwideworkshop.org/judges*

# VOICES FROM THE FIELD

## Globaloria Students and Educators Tell Their Learning Stories

The World Wide Workshop, in collaboration with filmmaker Andrew David Watson, has been documenting learning stories and reflections of young Globaloria students and their educators. In these video vignettes, they talk about how ideas in mathematics, science, civics, design, and engineering, as well as social media technology, become more comprehensible to them through conceiving and programming web-games on social issues. Since 2008, 43 vignettes have been produced for this award-winning Voices from the Field documentary series.

**Through the Quick Response (QR) icon on this page, you can access these videos by scanning the QR code with your smart phone.**

**Or watch online:**
www.WorldWideWorkshop.org/reports/vftf

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**Additional information:**
www.worldwideworkshop.org/partners
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## *The future of education lies in media literacy!*

"This special edition of the *JML* does what far too few academic resources are able to do: attain keen relevancy for both scholars and practitioners. Globaloria is a fabulous example of a digital innovation that is scaling-up based on both research and practice acumen. When teachers are in new roles of active discovery and scholars are paying close attention too, our youth are the prime beneficiaries."

> *Michael H. Levine* (@mlevine_jgcc), Ph.D., Executive Director, Joan Ganz Cooney Center at Sesame Workshop, New York, NY (JoanGanzCooneyCenter.org | @CooneyCenter); Former Vice President, New Media and Executive Director of Education for Asia Society, New York, NY (AsiaSociety.org).

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"Media literacy skills are some of the most critical skills for our next generation: how to find information, assess its accuracy, apply information creatively to solve problems, as well as discover, create, and publish content with technology. This edition of *JML* is an excellent resource for educators who want to improve the learning process and prepare students for future success. The issue is packed with the latest information and insights on how real-world game-based learning programs can strengthen media literacy and student engagement. I have been a long-time fan of Dr. Idit Harel Caperton. She puts learning and cognitive theories to action, and this latest report captures her valuable insights that can help propel the field."

> *Cindy Johanson* (@cinjo), Executive Director, The George Lucas Educational Foundation, and Producer of Edutopia, San Rafael, CA (Edutopia.org | @edutopia); Former SVP, Interactive and Education at PBS, Arlington, VA (PBS.org).

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"Game literacy is one of the important new literacies of the digital age. Combined with media, computer, information, news and civic literacies they form a basis for new learning, understanding, and engagement. This special issue of *JML* brings World Wide Workshop's and McCanse Award winner Dr. Idit Harel Caperton's Constructionist learning approach to these new literacies to demonstrate how game literacy can fit into the overall learning process of our nation's students. Globaloria extends this vision to underserved communities and gives color to the call of the Knight Commission and the Aspen Institute's FOCAS conferences for more informed and engaged citizenship to ensure a healthy democracy."

> *Charles Firestone* (@cfirestone), Executive Director, Aspen Institute Communications and Society Program, Washington, DC (AspenInstitute.org/policy-work/communications-society | @aspencs).