



FUTURE CLASSROOM

“ONE WORLD, ONE CLASSROOM” - AN EMERGING GLOBAL LEARNING ECOSYSTEM

James K. Chang¹, Randy Rankin²

1. Founder/CEO, Global Knowledge Exchange (GKE) New Jersey, USA
email: jchang@GKE.com
 2. Vice President & Product Director, COMWEB Technology Group, New York, USA
email: rrankin@COMWEB.com
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ABSTRACT

As society shifts from the “Information Age” to a new “Learning Age”, learning is no longer the preparation for a job, it is the job. Business and industry understand that the next wave of productivity gains will be realized through improved human capital management and by a massive global re-alignment of talent. The worldwide education community is responding creatively to this challenge. Educators have developed an innovative and much more systematic framework for learning – i.e. the “21st Century Learning Initiative”. Under this initiative both students and their teachers are lifelong learners. And they are expected to internalize a whole new set of 21st century skills and take more direct responsibility for their own individual learning. We call this bold student-centered self-paced approach “deep learning”. The only thing that matters is successful student outcomes. The demand is for good data, real-time performance support, and continuous tracking of actual student achievement.

Along with today’s new systems and the new focus on learning itself, comes a revolutionary organization concept for education. Schools are reinventing themselves and moving away from being mere teaching organizations and becoming instead real learning organizations. The classroom is being transformed. It is no longer a solo teaching environment. It is a student-centered, networked, lifelong learning environment that leverages the talents of a multi-generational learning team whose members are drawn from all over the world. The continuing development of this next generation global education workforce to support the new “net” generation of self-paced lifelong learners is absolutely essential.

The globalization of the education industry will continue to accelerate. The classroom of the future will need to be further re-engineered and become capable of quickly adapting to meet multifunctional, multi-cultural requirements. Schools will no longer be simple learning spaces. They will become instead highly interconnected hubs and integral parts of global multi-generational networked learning communities. Soon the personalization of each student’s learning path via an individual development plan (IDP) will be the norm.

The maturing of cloud computing beyond Web 2.0 applications will create a launching pad for effective “*global knowledge exchange*” – i.e. the “weaving of a web of knowledge”. The process requires a shared context to facilitate the building of new relationships regardless of differences in geographic location. The process requires a new type of global learning community, an “*intelligent human network*” - i.e. a “*net brain*”. Hundreds of millions of learners, educators, mentors, social entrepreneurs, school administrators and other stakeholders - including countless virtual assistants/digital avatars - will routinely interconnect, communicate, share knowledge, and collaborate in real time.

Classrooms of the future will be the building blocks in a rapidly evolving global learning ecosystem and catalysts for the next generation of education technology (ET) development. We predict a huge new ET industry and the deployment of the global education workforce will be its main driver. ET innovation will make “One World, One Classroom” a reality.

1. INTRODUCTION

As society shifts from the “Information Age” to a new “Learning Age”, learning is no longer merely the preparation for a job, it is the job. Business and industry understand that their next major wave of productivity gains will be realized only through improved human capital management and by a massive global re-alignment of talent. The worldwide education community is responding creatively to this important challenge. Educators have developed an innovative and much more systematic framework for learning – i.e. their “21st Century Learning Initiative.” Under this Initiative both the students and their teachers have become lifelong learners. And they are expected to have internalized a whole new set of essential 21st century skills and to have taken more direct responsibility for their own individual learning programs. We call this dynamic student-centered, self-paced approach “deep learning”. The only thing that matters will be successful student outcomes. And to move this process forward, the demand will be for good data, for real-time performance support, and for the continuous tracking of actual student achievement. One of the most critical skills for 21st century success will be an ability to innovate by formulating vital new ideas from older information. This idea generation activity will often be done collaboratively in teams of every type and size. Advanced “deep thinking” skills will be the foundation for our ability to innovate, to increase economic growth, to improve our society, and to address our environmental problems in the 21st century. Please note however that over the next decade (and beyond), the most significant innovations in education and training are likely to take place outside our traditional institutions. These traditional institutions are facing a serious dilemma. They are being asked to reconcile bottom-up development in education with the outdated top-down hierarchy that is currently in place. Meanwhile as a society we are in the process of shifting toward a “culture of creation” in which each of us has the opportunity and responsibility to shape our collective future. We are not only being forced to invent new selves but also entirely new types of organizations, systems, societies, economies, and knowledge.

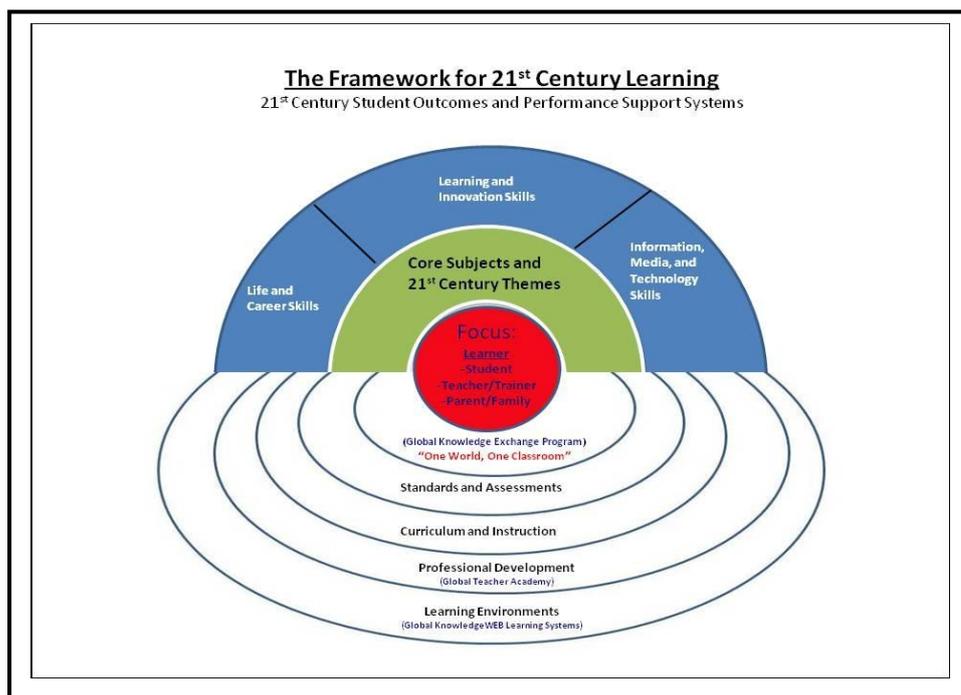
The big question becomes how to systematically transform schools into true 21st century learning organizations? What are the required steps? What are the specific tasks? What are the budget priorities? We would like to suggest here that re-engineering existing classrooms and learning centers is the logical first step toward building a school for the future.

2. FRAMEWORK FOR 21ST CENTURY LEARNING

Globalization increases competition – and risk. It means that people in the 21st century will need deeper and more specialized skills. At the same time, however, the new patterns of living and working in the 21st century also means that there is far greater demand for new interdisciplinary knowledge and for higher order skills such as collaboration, problem solving, and creativity. Without question, each of us will all be part of a new “learning society”. It’s a question of survival. And as the movement toward this new learning society accelerates, we will also be required to build a new infrastructure for learning, including strong support systems. The Partnership for 21st Century Skills has developed a vision for 21st century student success in the new global economy. The following “rainbow diagram” summarizes the specific elements (skills, knowledge, expertise) students will need to master in order to be successful in work and life. Mastery of both a set of core subjects as well new 21st century “themes” will be essential. The core subjects will likely include reading and language arts (both English and world languages), mathematics, economics, science, geography, history, government, arts, and civics. We believe that successful student outcomes are no longer mere competency in these core subjects. The focus is on promoting in depth comprehension of

good academic content at much higher levels by weaving the core subjects into overarching 21st century interdisciplinary themes: global citizenship and ecological interdependency etc..

Business and industry realize that major productivity gains can be achieved only through intensive human capital management and a global realignment of talent. The education community has responded by developing a new unifying framework, the 21st Century Learning Initiative, which focuses on student outcomes and the development of strong performance support systems. The human side of education reform has been overlooked for too long. Recruiting and developing talent, building organizational capacity, redesigning human resource departments and tying everything to a bold school improvement plan must be the main drivers for school reform as schools transition from mere teaching organizations into dynamic lifelong learning organizations.



3. GLOBAL KNOWLEDGE EXCHANGE ENVIRONMENTS

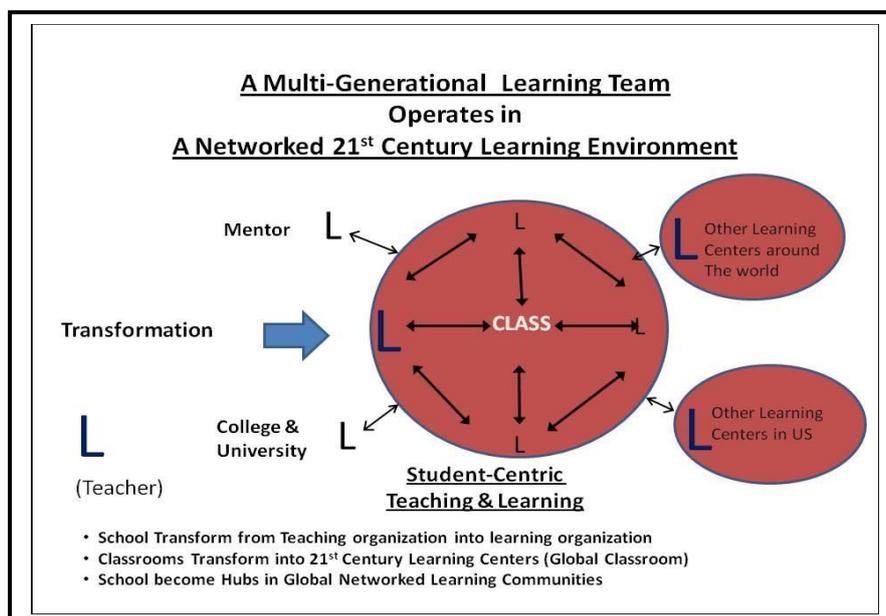
As globalization accelerates, it's quite common for businesses to use *global virtual workforce* deployment. Schools should follow the example of business as a way to improve the quality of teaching.. Classrooms as well will need to be re-engineered and transformed into multi-functional and multi-cultural global learning environments. Students today are all part of a "net" generation. So the new learning environment must be a "net generation" learning center or a "global classroom". Schools will need to be transformed from simple teaching organizations into powerful learning organizations. Schools as we have known them will no longer be the primary learning spaces. They will become instead hubs or nodes and be integral components of a vast network of global networking learning communities. After school programs will no longer be "after". They will be important, fully integrated components of the total learning network. Soon the customization/personalization of each student's learning path will become the norm. The next generation learning center must be designed to support student-centric, collaborative teaching and learning practices. Any 21st century learning environments worthy of the name needs to accommodate many different teaching and learning methods. It is an environment where knowledge is not only consumed but actively created and where state-of-the-art systems are in place for capturing

“process knowledge” and for providing a real time assessment and continuous improvement loop as well. The new 21st century learning center (or global classroom) must serve as a multi-generational, multi-cultural learning environment. It’s a modular, flexible, scalable environment – i.e. a true “*Knowledge WEB Learning System.*”

The maturing of Cloud Computing beyond Web 2.0 social networking applications has laid the foundation for a new type of “*intelligent human network*”. Hundreds of millions of people (knowledge workers, creative workers, entrepreneurs, investors, and other stakeholders - including countless new virtual assistants or digital avatars) will routinely interconnect, share knowledge, collaborate, and communicate in real-time. New findings and new experiences, specific to many different subject domains, will be rapidly assimilated and disseminated. And as additional insights are developed and fed back into the system, knowledge itself is continuously transformed. A good description for this dynamic technology-mediated process will be the “*global knowledge exchange*” or the “weaving of a web of knowledge”. The process requires a shared context (or shared space) to facilitate the building of new relationships as well as shared values and shared skills regardless of differences in geographic location, language or culture. And the process is certain to accelerate with the addition of a formal knowledge exchange mechanism which acts as a marketplace and delivery vehicle for the many outputs or products that result from the new collaborative knowledge work.

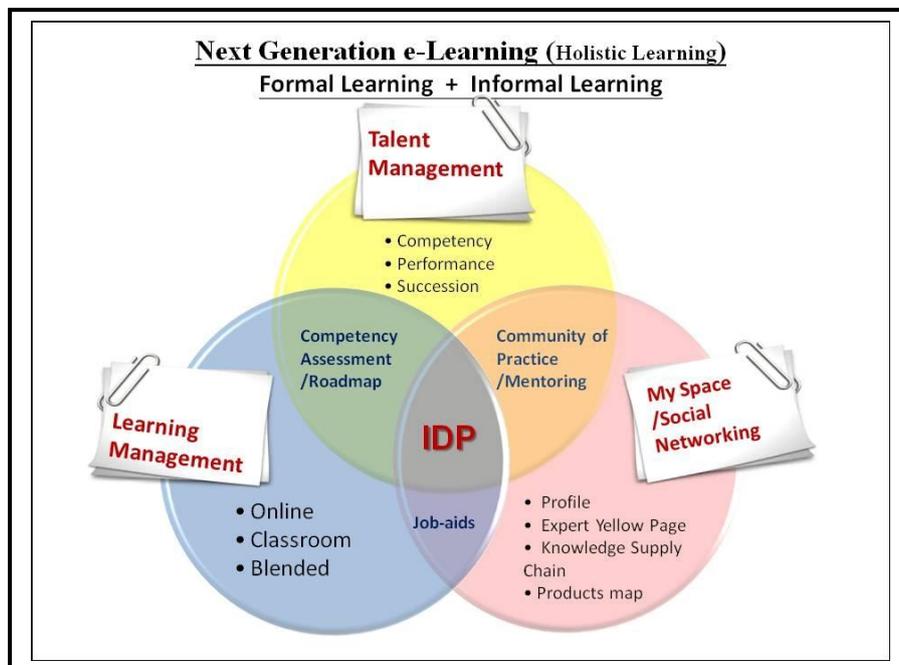
4. NEXT-GENERATION GLOBAL WORKFORCE FOR EDUCATION & TRAINING

As we transition from old fashioned stand alone (solo) teaching practices to fully networked, multi-generational team learning, the transformation will be catalyzed by a globally-oriented educational workforce. But this large distributed workforce will not come into being on its own. Shortages are inevitable unless we build a network of certified, next generation, global teacher academies dedicated to training a new “net generation” education workforce with the skills need to serve the new global learners.. We also anticipate a rapid surge in the number of expert global “educational entrepreneurs”, both generalists and specialists, many with unique know how and highly marketable and valuable “trades”. This large cadre of freelancers will (for a reasonable fee such as micro payment) provide in a timely fashion high quality education services to individual learners anywhere in the world. This army of certified expert soldiers (mentors, tutors, potential employers) will in turn be actively assisted and monitored by the multi-disciplinary teams of educators trained by the global teaching academies.



5. HOLISTIC LEARNING (FORMAL + INFORMAL LEARNING STRATEGIES)

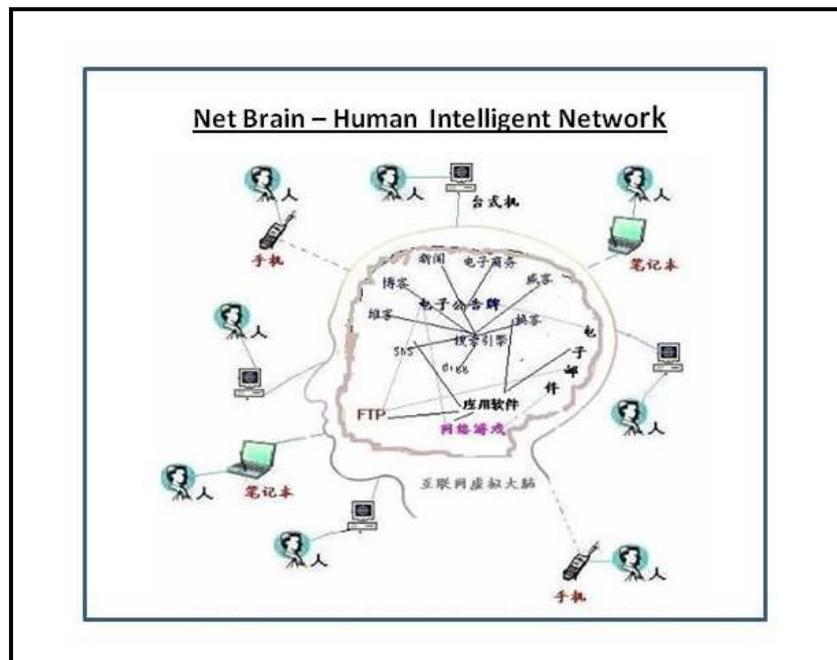
Today's e-learning management systems (LMS) are a relatively recent invention but have already achieved a surprising level of sophistication. They began usually as simple drill and assessment tools but involved into complex virtual multimedia learning environments with incredible depth of content. Indeed we've witnessed double-digit growth of online learning communities because of the availability of these LMS. What began in K-12 and higher education as a basic value-added option for traditional classroom instruction has become instead a highly disruptive technology which threatens through to replace not only classroom teachers but entire educational institutions. For corporations, what began as a mere learning platform purchased by internal training departments has become a mission critical system – i.e. the next frontier in human capital development and talent management. E-learning delivers not only huge productivity gains but has become now a key competitive advantage. Reusable digital content repositories and extensive online course libraries are important corporate assets. The trend is clear for the next generation of e-learning systems. Learning management, social networking, talent development, and knowledge management functions are converging toward a more holistic learning approach that combines formal and informal learning strategies.



6. NET BRAIN: AN INTELLIGENT HUMAN NETWORK

Individual human brains are of course the most powerful computers. But the Web 2.0 phenomena are highly suggestive of the next wave of Internet development. We are in the very early stages of being able to join together individual human brains to form an even larger computer, a new "net brain". This net-brain would be an unprecedented project for mankind and on a scale so vast that it could never before have been attempted - or even thought possible. Digital avatars, virtual worlds and an almost infinite amount of information are all potentially components of the net-brain. From the viewpoint of a corporate enterprise or a national government, such a development would mean that tens of thousands of workers scattered nationwide or worldwide (as well as supplier and customer networks) can routinely interconnect, communicate, collaborate, and share knowledge synchronously and asynchronously. Current infrastructure and emerging cloud and mobile computing further

suggest the potential of a net-brain and its development into an intelligent human network. The ultimate goal of such a network would be to endow people with external brains of huge capacity and empower them to instantly share skills, experience, knowledge and wisdom.



7. HOW TO PLAN, DESIGN AND ENGINEER THE FUTURE CLASSROOM

Ask the students themselves, especially the new global learners already in the K-16 pipeline, what are the best kinds of classrooms. The answer for them is easy. They want relevant, real-world, hands on learning opportunities. They want to be able to learn from each other and from a large and constantly changing and highly distributed multi-generational, multi-cultural group of mentors and tutors. Indeed, some of the smartest individuals from this group of new global learners have already figured out how to reach out on their own and they are already interacting with partners all over the world. In short, the classroom of the future must be a good project space, an unstructured studio environment, a self-paced learning center, and a blended hybrid of virtual and real . Traditional solo teaching environments are boring by comparison and this includes even classrooms equipped with the most expensive and newest technologies. The big mistake that most school IT managers make is that they are too focused on the individual products: big screen flat panel TVs, interactive whiteboards, net-books, smart-phones or laptop carts. The IT manager’s idea of progress is to replace a slow PC with a faster one or old software with an updated version. We need to avoid slow incremental improvements such as these and completely rethink the classroom.

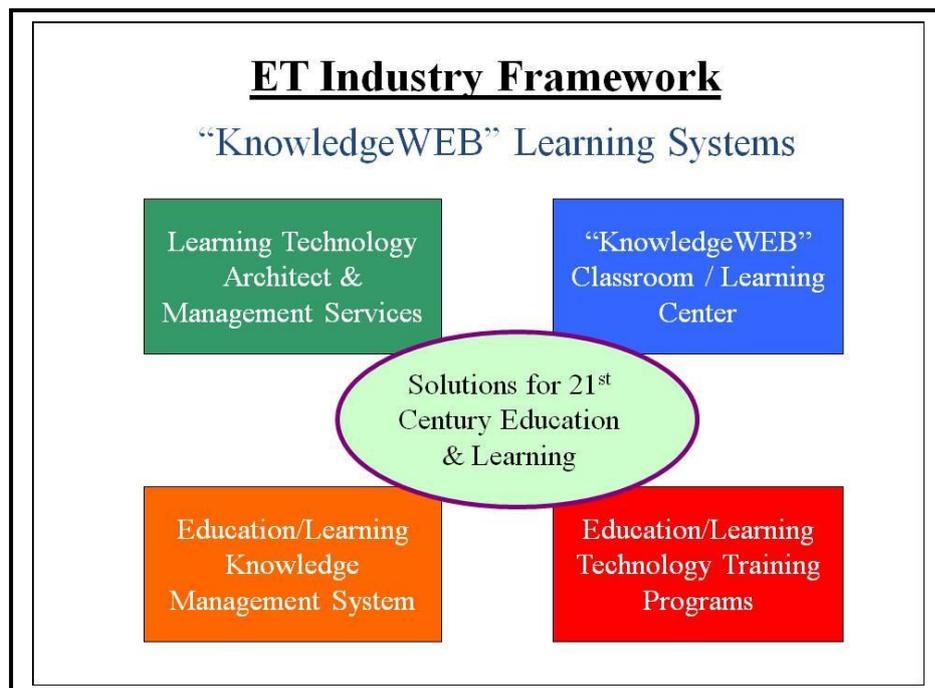
The future classroom will be a fully integrated, highly standardized, low maintenance “system product” in much the same way that a car or an airplane is a turnkey system product. The future classroom will be an open system and integrate every possible network, device, and operating system. It will be future-proof and any new device or technology that comes along is certain to fit. To the extent possible, it is built with low-cost consumer type technologies. It will be outward looking and routinely interconnect with other similarly equipped classrooms in hub and spoke configurations: one-to-one, one-to-many and many-to-many. This is an incredibly information rich environment. And the room itself becomes the most important lesson – i.e. a lesson in lifelong learning and in the creative uses of technology. Below is a list of some useful general guidelines for creating a fully-integrated yet flexible system product.

HOW TO PLAN, DESIGN and ENGINEER the FUTURE CLASSROOM

- Re-engineering the “mindset” of the teacher and school administrators is more important than the technology itself because we often use new tools to do things the old way.
- The classroom infrastructure must encourage holistic(formal &informal) learning and support the U.S. Framework for 21st Century Learning,
- The classroom technology infrastructure must integrate PCs, laptops, interactive whiteboards, net-books, smart phones, digital cameras, and any of the many emerging mobile devices such as media tablets (I-PAD) or e-book readers.
- The future classroom must be software and computer independent (an open system).
- The design of the next generation learning center must be capable of empowering student-centric learning, collaborative teaching & learning practices.
- The classroom infrastructure must accommodate many different teaching methods
- The classroom of the future must be able to capture process knowledge and provide real time formative assessment and a continuous improvement loop.
- The future classroom must be multicultural and multi-language. It must be able to support a multi-generational teaching and learning team.
- The future classroom needs to be multi-platform (including cloud computing) and be able to integrate e-learning 2.0, e-publishing 2.0 & educational content exchange functionalities as well as professional social networking tools
- The future classroom must be flexible and very easy to instantly reconfigure.

8. DEVELOPMENT OF EDUCATION TECHNOLOGY (ET) INDUSTRY (ET 2.0)

The classroom of the future will be the fundamental building block in a rapidly evolving global learning ecosystem and the catalyst for the development of the next generation of innovative learning systems. The maturing of the IT industry and the convergence of e-learning, WEB 2.0, knowledge management, and talent management have laid the foundation for a next wave of major industry productivity improvements. We call this framework the new “ET Industry”. It will require close collaboration among a large group of technology partners worldwide similar to what is happening in Health IT (HIT). The ET industry will require its own global learning community. The resulting ET innovations will make the “global knowledge exchange” industry and “one world, one classroom” a reality.



9. SUMMARY AND RECOMMENDATIONS

- A) This paper is a call to action. The overarching challenge facing us today is to re-conceptualize and reinvent the classroom to better serve the new global learner. The solution will require us to bring together peopleware, technology, modern pedagogy (the “rainbow”), detailed student assessment data, individual student portfolios (and development plans), large-scale national and global databases, a huge library of good digital content - and bold organization ideas.
- B) The forces driving the transformation of education and training are the same as those driving the transformation of society in general. While it’s nearly impossible to even guess what exact shape the Internet might take 3, 5 or 10 years from now, the idea of a big net brain provides a useful picture of technology convergence. It’s as if every individual will carry with themselves a powerful external “brain” to help them learn. This “new net-brain” will have countless applications and fulfill the ultimate human desire.
- C) We are confident too in predicting the emergence of a vast new global education workforce (multi-cultural, multi-language, multi-generational, highly skilled, entrepreneurial, and assisted by a whole army of digital avatars or automatons of some kind) that will be responsible for training the knowledge workers of the future. Collectively this global education workforce will constitute a sophisticated market for the inventions that the new education technology industry (ET 2.0) turns out.
- D) The ET industry’s most important product will doubtless be the future classroom itself. This future classroom won’t be a loose collection of different hardware and software products. A properly designed future classroom will be a fully integrated, highly standardized “system product”, a future-proof system with no built-in obsolescence because it’s designed to easily integrate (plug-and-play style) any new device or technology that might come along.
- E) We must provide the necessary technology building blocks within an emerging global education ecosystem for effective global knowledge exchange programs (“one world, one classroom”). Large-scale (democratic) gke process hasn’t been possible until right now. Global knowledge exchange will operate by nurturing the development of highly inter-connected global learning communities of every type and size.
- F) The new ET 2.0 industry and the formation of a new global education workforce that mentors the new global learners is a huge opportunity for business and industry in general. The net brain paradigm, the new ET 2.0 industry framework, the new global education workforce and the new fully integrated “future classroom” system are certain to be powerfully disruptive but also hugely profitable ideas. Governmental and business leaders and key policymakers need to understand and act upon these opportunities. Nation can be a leader in the rapid development and deployment of these new global learning ecosystems under the umbrella concept of “*one world, one classroom*”.