Facilitating 21st Century Education: Leapfrogging Culture and Time through Simulational Learning

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This paper asserts that changes in the global economy and the global society mandate an immediate adaptive response on the parts of education service systems. Cultural and temporal simulations offer dynamic, open source approaches to reformatting education for new relevance in the 21st century. Vigorously and imaginatively pursued, such simulations can permit educators and their students not merely to adapt to industry, business and government, but to leapfrog ahead and share in their leadership. The paradigm invention associated with such changes focuses on knowledge production emanating from three broad cultural resources: tradition and legacy; spontaneous emergence and evolution; and intentional creativity.

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“Memories are ‘stories’ we use to make good choices.”
(A Whole New Mind, Daniel Pink)

“The simulation’s the thing!”
(Variation on Shakespeare, anon.)

Introduction

Cultural boundaries, both personal and collective, operate to compartmentalize and limit human perceptions of futures, pasts, and presents. This paper examines opportunities to leapfrog beyond constraints of cultural ethnocentrism (culture bias) and cultural tempocentrism (time bias) at all levels of learning.

The paper describes how to cope with these problems through ethnogenesis (culture design) and tempogenesis (time design), two “soft” technologies that enable learning designers and instructors to transform otherwise static information into enriched learning opportunities based on alternative cultures. Applying these two soft technologies in learning environments can, and does, produce leapfrog effects.

Leapfrogging means to jump over obstacles to achieve goals. It means to get ahead of the competition or the present state of the art through innovative, time-and-cost-saving means. One example of leapfrogging is Finland’s jump to wireless phones, saving that country the cost of deploying an expensive copper wire system. Another example is present in the Kent, Washington public schools system, which now permit students to use wireless Web devices to help them access information to better pass tests. Leapfrogging has also become a major strategy of developing countries wishing to avoid catch-up efforts that otherwise portend a high likelihood of continued followership. A similar approach to gaining the lead rather than assuming a persistent runner-up role has been adopted by many industries, schools, and individuals.

The authors work under the assumption that cultures and time contexts are manipulable; and, that human futures, presents, and pasts can become highly dynamic, permitting the design of intentional cultures within artificially flexible time frames. Such cultures and their “flex times” offer vastly expanded opportunities to
reevaluate histories, reassess presents, and multiply alternative futures. In other words, to leapfrog means to redesign understandings and approaches to cultures and time.

This paper describes two techniques for enabling leapfrogging at the individual and collective student levels. One of these is StoryTech, a process allowing individuals to design and experience intentional personal cultures within flexible time contexts. A second is DramaTech, which is built upon the construction of intentional shared cultures, also within flexible time constraints.

The paper concludes 1) by describing a broad knowledge construction platform for use in intentionally designed cultural and temporal simulations by educators at all levels and all educational contexts; and 2) by projecting future uses of cultural and temporal simulations as skills that are usable lifelong (i.e., as “new basics”).

Constraints of Ethnocentrism and Tempocentrism

“Culture” is variously defined, but, for the purpose of this paper, it is characterized as a concept that helps to explain how humans use symbolic constructs and processes to create meanings and make decisions with respect to the concrete world. The boundaries of culture are both personal (individualized cultures) and collective (shared cultures). It is our view that personal and collective cultures operate largely along a continuum from the virtual to the concrete. In that sense, the concrete world is creatively constructed, encountered, assessed and reconstructed.

When either personal or collective cultures are assessed as negatively limited, they are defined as expressions of ethnocentrism (see esp. Bennett, 1993). Similarly, when the time frames employed within personal or collective cultures are assessed as overly constricted or overly expanded, they are defined as expressions of tempocentrism (see, for example, Textor, Angkanarak, & Bayardo, 1985). Somewhat ironically, specific personal and collective cultures are inevitably ethnocentric and tempocentric from one point of view or another.

Examples of ethno- and tempocentrism operating together are often easiest to find in histories of national achievements, battles, heroism, and justifications for patriotism. Inevitably, public education systems are among the significant delivery systems for ethno- and tempocentric renderings of national histories, myths, legends, and achievements.

When differences over personal and collective cultures arise, as is inevitably the case, difficult – and sometimes fatal – results can befall disputants and bystanders. But viewed from the vantage points of certain theories, such as those of self-evolving and intentionally created systems, ethnocentrism and tempocentrism are the opposite sides of two coins whose flip sides offer theoretically limitless opportunities for humanity.

Advantages of Ethnogenesis and Tempogenesis

Ethnogenesis, on the opposing side of the ethnocentric coin, is a source of cultural creativity, invention and innovation. Ethnogenesis provides a source of cultural novelty, new decisions and altered behavior options including leapfrogging. We must, however, take note of an important caveat: since the future cannot be reliably predicted, there is no guarantee that an improved concrete world would result from specific, intentional ethnogenic actions.

Ethnogenesis in restrained expressions is an example of constructivism. In its more extensive manifestations it exemplifies radical constructivism. One way to illustrate this distinction is to compare evolutionary improvements and gradual teacher performance upgrades to the replacement of formal schooling by personalized learning delivered via networked, information and computing services augmented by intelligence amplifying (IA) systems.

One of the easiest homilies common to humans is that we can learn from the past. Two related
aphorisms are that we must never repeat the past, and that we are doomed to do so. Cynics argue we rarely learn from the past and are doomed to repeat our mistakes. Our approach to the creation of intentional cultures is to employ ethnogenic and tempogenic processes, so that learning simulations can involve alternative and interactive pasts, presents, and futures.

Tempogenesis offers new choices concerning how time is perceived and utilized as a framework for human activities. While tempocentric cultures tend to employ rigid time constraints to frame cultural beliefs, practices and histories, tempogenic cultures vigorously explore alternative pasts, presents, and futures. Interactive approaches to such alternatives may offer many heuristic frameworks and choices, again with no guarantees concerning concrete world outcomes.

Despite the high levels of uncertainty over whether ethnogenesis and tempogenesis can actually produce improved real world results, their reflective and feedback-looped practice remain critically important for creating new perspectives and decision options. In addition, ethnogenesis and tempogenesis enhance individual and group tolerances for ambiguity and enhance their abilities to manage uncertainty. In organizational settings, such perspectives are at the very core of requisite variety, or the capacity of human personal and collective cultures to both create and respond to challenges by refocusing their explicit and tacit resources. Larger reservoirs of requisite variety are linked to choice enhancement.

**Educational Roles for Ethnogenesis and Tempogenesis**

The production of alternative cultures is becoming ever more important in coping with increased chaos, complexity, unpredictability, uncertainty, and to move beyond failed or outmoded perspectives and choices. Ethnogenesis and tempogenesis may be construed as “soft” technologies that enable learning designers and instructors to transform otherwise static, information-bound curricula into enriched learning opportunities based on alternative cultures.

Under the assumption that cultures and time contexts are constructed and manipulable, human futures, presents, and pasts can become highly dynamic, permitting the design of intentional cultures within artificially flexible time frames. Such cultures and their “flex times” offer vastly expanded opportunities to reevaluate histories, reassess presents, and multiply alternative futures.

Ethnogenic and tempogenic processes are intended to help students understand conventional pasts, presents and futures within the frameworks provided by intentionally created cultures. On the one hand, these activities must occur within the restricting time frame of the 24-hour global clock. But on the other, they may occur within different time frames associated with particular intentional cultures. These two cultural and temporal environments, one immutable and the other infinitely mutable, provide dimensions for a continuum in which rich comparisons and synergies between the two may be created, with associated increments in learning.

**Tools that Enable Cultural and Temporal Simulations**

The authors employ two techniques to help enable cultural expansions at the individual and collective student levels. The first of these is StoryTech, a process allowing individuals to design and experience intentional cultures within flexible temporal contexts. A second is DramaTech, a process that facilitates social simulations built upon a process similar to that employed by StoryTech. Both StoryTech and DramaTech were developed by Arthur Harkins in 1988 and 1991, respectively.

**StoryTech**

For thousands of years, stories have been the major pedagogical tool of all cultures. For example, the children’s rhyme “Jack and Jill” is a story about two people who intend to seek and transport water, but who suffer an outcome probably fatal to Jack. This story was intended...
to convey a warning that the simplest and most
to convey a warning that the simplest and most
familiar of futures can be dangerous.

But students as young as in the fifth grade level
easily understand that the original “Jack and Jill”
story offers a frontier of probably limitless
positive adventures involving these two characters.
“Jack and Jill” offers a sufficient foundation for
“virtualizing” the original story – that is, for
transforming it into a pathway into perceiving
and vicariously experiencing a different future.
In the same sense that Jack does not always
have to endure a skull fracture, he is under no
obligation to climb the hill in the first place.
Among infinitely endless alternatives, Jack can
choose to avoid the hill or to send up a remotely
controlled vehicle to ascertain the danger level
for humans.

The reasoning structures used for building “Jack
and Jill” stories are the same as those underlying
computerized simulations of families, societies
and civilizations. Such exercises are projected
years or centuries “forward” into heuristic
futures. A very large and growing market exists
for such simulations. Although not necessarily
intentional, the engines behind these simulations
are ethnogenic and tempogenic in nature.

The StoryTech process has been used in private
and public sector organizations for nearly two
decades. The process consists of written
exercises, group discussions, and written and
oral feedback of previous StoryTech exercises.
(See an example of a StoryTech exercise at the
conclusion of this paper.)

Used in the context of public communities,
StoryTech is a method for allowing a fuller
glimpse of what young and old, professional and
non-professional story-writers project or
envision as personal and collective outcomes. It
has been used in grades 1-12 and in
undergraduate and graduate classes. Beyond
formal education settings, it has been used with
corporate boards, NASA, and many other U.S.
government agencies.

The StoryTech process is transitional, focusing
on the path from the present toward preferred
personal and collective futures. The guided
nature of the process asks the writer to help
create a successful “virtual” (seeming or
apparent) self in a pre-described successful
future. The writer's task is to acquire and define the
virtual self who has helped to create successful
future personal and collective outcomes. The
effect of creating successful virtual selves and
positive future outcomes is to motivate
individuals to personally rethink and reassess
histories, contemporary living, and alternative
futures.

The advantages of StoryTech include 1)
developing skills for describing and evaluating
plausible personal and collective futures; and 2)
demonstrating that plausible personal futures do
not have to be delayed until tomorrow – their
continued development can leapfrog into being
and praxis today. Participation in StoryTech
exercises has the effect of altering both personal
and collective cultures to permit more open
access to re-conceptualized and newly created
pasts, presents, and futures.

DramaTech

DramaTech is a dynamic simulation process for
groups of individuals. The guided nature of
DramaTech helps students practice innovation
within intentional social circumstances.
DramaTech enables students to anticipate how
others might respond to their goal-seeking and
goal-attaining behaviors. As such, DramaTech
acts in synergy with StoryTech.

DramaTech helps students construct plausible
cultural and temporal simulations of any type.
Such simulations may include ill-defined or
voluminous cultural descriptions; what, how,
when and why things are done there; the
problems or barriers to be overcome; and, the
constructed meanings of the simulation in
students’ academic and personal lives.

DramaTech simulations focus on rehearsing
innovations for the real world while learning
how to convert problems into opportunities, or
confusion into clarity, within simulated worlds.
DramaTech demonstrates how to bring tacit
personal knowledge into the explicit foreground
of such simulations. DramaTech process offers
students techniques for rehearsing the
challenges and opportunities of goal-focused
behaviors, including innovative ones. Furthermore, as StoryTech offers opportunities to leapfrog as a person, DramaTech helps individuals rehearse leapfrog behaviors in social simulations. (See an example of a DramaTech exercise at the conclusion of this paper.)

Eight (8) basic DramaTech skills are employed to help students construct and operate simulations in selected social circumstances:

- The first DramaTech skill focuses on how students may use simulations to make decisions within concrete and virtual realities, and to connect the two.

- The second skill is to facilitate the use of guided imagination in the (sometimes audacious) process of converting hallowed realities or vague possibilities into controlled dramatic expressions.

- The third skill employs plots and scripts for creating detailed simulations. Plots and scripts are necessary tools for helping students design and develop their ideas through self-improving and self-correcting simulations.

- The fourth skill employs roles and role playing to effectively integrate actors or agents within simulations. As Pink (2005) writes, “what’s in greatest demand today isn’t analysis but synthesis—seeing the big picture and crossing boundaries, being able to combine disparate pieces into an arresting new whole” (p. 66)

- The fifth DramaTech skill is learning to employ routines and improvisations to construct both standardized and improvised patterns within simulations. Routines are relatively “automatic” while improvisations are highly innovative – and sometimes accidental. Knowing when and how to employ routines and improvisations effectively is a lifelong development process.

- The sixth skill is learning to work effectively with collaborators and supporters.

- The seventh skill is learning how to influence stakeholders and critics. While stakeholders will usually hope students will produce insightful simulations, are looking for problems. Critics may even try to sabotage simulations. It is important for students to develop to curry a diplomatic process for use with both stakeholders and critics.

- The eighth DramaTech skill is learning to balance the “long view” against the short. More conservative observers tend to prefer that both long-range and short-range simulations be conventional and linear. More imaginative observers may wish for “breakthrough” simulations featuring daring new social formats. Because each type of observer is a market niche, it is useful for students to learn to treat them as such.

In general, it is preferable for students to experience StoryTech simulations prior to those that are associated with DramaTech exercises. This sequence is appropriate because StoryTech exercises are relatively simpler, and because these exercises build confidence in the quick construction of new personal roles or “virtual selves” that can populate DramaTech simulations. Together, StoryTech and DramaTech are potent engines for students interested in leapfrogging into new or reconstructed cultures and time frames.

The Emerging Necessity for Leapfrog Education

As do many others, such as Friedman (2006), Pink (2005), and Florida (2005), we see a trend toward the expansion of applied imagination within the burgeoning global trends, cultures and markets. Imagination-based work is now regularly conducted by knowledge and innovation workers, some exemplars of whom are creative teachers, designers, artists,
storytellers, game developers, Web masters, and media content creators.

Our intent in this paper has been to indicate how, through two relatively accessible and complexity-controlled simulation methods, students at any level, and in any culture or country, can engage in the creative design process. In other words, we foresee a near future in which educators and their students parallel, collaborate with, and leapfrog beyond industry and business leaders involved in the creation of the new.

If leapfrogging is to develop an everyday presence in the schools of the world, ethnogenic and tempogenic processes and their products will need to be located within a broad, flexible architecture of knowledge production. For these purposes, it will be necessary to develop and adopt a new paradigm of education and human capital development that goes beyond the limitations of legacy architectures. Underlying the two practical steps we have reviewed, StoryTech and DramaTech, there must be a broad substrate of knowledge production that is tolerant and supportive of diversity. We believe that this design can be composed of three knowledge production domains: 1) traditional, legacy-based knowledge; 2) spontaneously emergent, evolving knowledge; and, 3) intentionally created knowledge.

Of critical importance is that this ecology be more than a trio of abstractions or a static taxonomy. We view the three substrate components as essential for bringing education into line with the needs of 21st Century business, industry, government, and civic life.

What are the core meanings of the three knowledge production domains? The first builds upon legacies and traditions, sometimes seeking relatively conservative improvements in what already is. The second is observational and occasionally provocative, seeking to understand ineffable complexities through observation and calculated disruptions. The third is teleological in nature, ceaselessly and creatively attempting to create the new, sometimes to help reach a goal and sometimes for its own sake.

While the authors of this paper have argued for the massive growth of applied imagination through ethnogenic and tempogenic educational practices—specific applications of teleogenic knowledge production—we in no way believe in or support the idea that creativity and leapfrogging cannot or should not be available to the traditional and emergent knowledge production sectors.

To the contrary, it is our contention that a New Paradigm of knowledge production and education, driven by advancing technology and by new worker and consumer behaviors, is growing all around the world. Ethnogenic and tempogenic processes are at work everywhere, albeit in varying degrees and configurations.

This New Paradigm, together with its knowledge based simulational approaches to ethnogenesis and tempogenesis, is part of a “new basics” for education and life. The authors invite further discussion on these subjects through our Web site, located at http://www.educationfutures.com, and we look forward to participating with others in the development of the New Paradigm of education, one that is imaginative, exemplary of praxis, serviceable in the context of globally emerging social and economic needs, and inclusive of all.

End Notes I: Introductory StoryTech Example

"Personal Model" StoryTech

It is 2023. You are ________ years old. You have been very successful in all phases of your life. You have given many commencement and other presentations about your life and how you have reconstructed it over the past several decades. If fact, you just gave one of these speeches tonight, on ____September 2023.

What was the occasion?

What did you say in your presentation?

Why did the audience respond so well?
What did you say when the TelePresence (3-D 1080p) personality interviewed you, starting with the question, “What made you so successful as an individual?”

End Notes II: Introductory DramaTech Example

Using DramaTech is a step toward understanding, orchestrating, and delivering value through your innovations in the real world. We are using The Whole New Mind text because it makes the point that analysis in the left brain is now necessary but not sufficient. One also needs the right brain for synthesis. Which side of your brain are you using right now, and why?

Have you ever been involved in rehearsals in your life? Please relate one or two such examples.

Using plots and scripts will help you create simulated “plays” for structuring your innovation rehearsals. Plots and scripts are key tools to help innovators develop their ideas through a continuously self-correcting design process. Describe a situation when you once thought up a plot and a script in order to rehearse something you wanted to do in the real world.

Roles and role playing for actors or agents in your innovation-focused plays and rehearsals create helpful integration and synthesis. As Dan Pink says: “What’s in greatest demand today isn’t analysis but synthesis—seeing the big picture and crossing boundaries, being able to combine disparate pieces into an arresting new whole.”

What is the single best example of role synthesis you’ve ever experienced in the workplace?

Routines and improvisations will help you construct standardized and improvised patterns within your innovative plays and rehearsals. There are several types of innovation, running from slight improvements to major improvements, and from there to leapfrogging. When have you leapfrogged in your work or domestic life? What kind of innovation was involved? Why were you successful – or not?

Working with investors and supporters provides upfront resources for your Innovative plays and rehearsals. To be an effective innovator, you need to have investors and supporters in close relationships with you and your work. These relationships help to build Innovation relationships that can begin small but grow very large. Who was one of the greatest investors or supporters in your past attempts at doing something innovative? How did this person help?

Influencing audiences/stakeholders and critics is very important! Stakeholders want your Innovations to provide benefits to them, while critics are always looking for problems. As you Innovate, you may need to “mind read” your stakeholders and critics, so that you know how they’re evaluating your work. Describe an audience that loved your innovative behavior in the past. How did they show their approval? Describe a critic. How did the critic behave?

Long run performances and short run performances refer to the start-to-finish time frames of your innovative plays and rehearsals. How long do you want an innovation simulation to run? When are the best times to continue them or shut them down? Give examples of one short run and one long run innovation performance in your past. Why was one performance short and the other long?

References


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**Editorial review: Facilitating 21st Century Education**

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The article is a little thin in that the authors try to cover so much. It would be nice to dig more into their ideas of ethnogenesis and tempogenesis and illustrate it with more contemporary examples. Also, the use of leapfrog as a descriptive term seems a bit cheeky given the context of the journal, maybe make it more clear how this article is trying to set the tone for the journal in general. In discussing innovations in education, it seems that you could also better reference writings and examples of work that support your contentions for ethnogenesis and tempogenesis (and how these terms relate to other educational paradigms). I’d recommend the writings of Stephen Downes, George Siemens, and many other weblogs and websites. In terms of texts, the writings of Clark Aldrich and James Paul Gee seem pertinent as well. All in all, this is an interesting article that just begins to scratch the surface of it’s ideas, and it would be nice to see the authors dig even more.

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