DOI:10.6531/JFS.2017.22(2).A41
ARTICLE
.41

Serious Play: Transforming Futures Thinking Through Game-based Curriculum Design

Kuo-Hua Chen
Tamkang University
Taiwan

Jeanne Hoffman
Tamkang University
Taiwan

Abstract

This article gives a description of how gamification is being used to redesign the futures core curriculum at Tamkang University. Eight game-based activities have been developed and delivered during the 2017 school year are explained. Over 600 students have participated in some or all of the games described in this article. Gaming and gamification is a relatively new way of engaging students of futures studies, and it has been found to be an effective way to enhance students' learning.

Keywords: Gaming, Gamification, Images of the future, Collaborative working style, CLA, Futures triangle, Postnormal, Futures wheel, World café.

Introduction

For over forty years Tamkang University (TKU) has been teaching futures studies courses as part of its undergraduate core curriculum. Futures studies is one of the university's three major strategic objectives: globalization (the spatial pattern of the future), information-oriented education (the life pattern of the future), and future-oriented education (the time frame of the future) (TKU web page). Clement Chang, the founder of TKU explains that in eastern cultures, "we set goals, but have no regard for the process" (2004). He set an ambitious vision for TKU to "not only to project future change but to create future changes…especially the intelligence and courage to make things happen for the tomorrow that we expect to have" (Chang, 1998).

We are proud that futures studies is a required undergraduate course, but futures is more than a course; it is a way of thinking. Thus, the real issue is futurization. For those of us who teach and have reflected on the teaching of foresight and futures, this means a number of things: (1) Learning how to learn; (2) Anticipating new technologies and using those most appropriate for education; (3) Understanding the changing nature of demands on our university; (4) Comprehending the deeper patterns of change and (5) Using futures thinking to create a better learning environment.

Futures thinking needs to go through an appropriate futures-oriented process in order to create alternative visions to current ways of living. This can be an uncomfortable challenge when known structures and patterns are challenged (Hoffman, 2014). In Taiwan the issue of most consequence is that of China's rise. Furthermore the regional and global economy is struggling to fully understand how this transformation and challenge (the rapid rise of both China and India - Chindia) will force the world, especially neighboring countries to become more foresight-oriented. Changes in the age-cohort, with concurrently aging and declining populations, will also take the field of Futures Studies in greater Chinese societies into different directions. What takes place in the future depends on how the instruments developed today are used and the results of the planning being done for the years ahead.

Futures courses at Tamkang University were designed into five different yet correlated categories, according to STEEP discourse. Twenty-five professors, as groups of experts, offer futures courses based on their respective expertise in social, technological, economic, environmental and political futures. Notwithstanding the diverse pedagogical approaches, professors have generally agreed on the following general teaching guidelines:

1. Lectures on major areas of the knowledge base of Futures Studies
2. Interactive activities on identifying emerging issues
3. Workshops/Small group on developing/creating alternative futures
4. Futures methodologies (futures triangle, futures wheels, archetypical futures scenarios, etc.) applied to group presentations
5. Youtube, TED Talks and movie clips on generating reflexive thinking toward the future images of integrated technologies and humanity.
6. More recently, 'personal futures' has been an emergent area of study – helping to personalize the theories and methods used by students in an effort to produce deeper connections with the concepts of futures studies.

In the first few decades, professors teaching futures courses have shared the consensus of developing futures curriculum as a model of learning among fifteen different categories of Tamkang's core curriculum. The major teaching objectives include: (1) to enhance students' comprehensive knowledge and wisdom on various emerging issues and topics; (2) to develop students' multidisciplinary interests with a diverse worldview; (3) to cultivate students' willingness to adopt different ways of knowing; (4) to differentiate contrasting views of the future, plural/alternative versus singular/predictive; (5) and to improve students' capacity and courage to pursue their desired futures. Stated simply, the common teaching goal is to open up futures options by questioning default problem-solving solutions. Many possible futures thus are waiting to be explored and preferred futures have greater probabilities of being realized.

Rethinking the Futures Curriculum

An international conference themed "Gaming the future: pedagogies for emergent futures" was held in November 2016 at Tamkang University, in association with Kyung Hee University and the Hawaii Research Center for Futures. The theme of the conference was motivated by two intertwined developing processes: (1) the new generation of students, so-called digital natives, who are deeply exposed to increasingly sophisticated information online (Prensky, 2013), and (2) the emerging changes in futures workshop formats including Knowlabs and immersive futures which actively include participants in the futuring process. They are not mere spectators, nor receivers of the futures, but active creators. The futurist thus becomes a content facilitator, helping participants explore alternative futures and create desired futures. It is in this context that gamification through

the use of game design and mechanics to enhance the teaching of futures studies has become recognized as complementary.

The gamification of knowledge, process and action, is likely to grow as digital natives move to global and national decision-making and policy positions in defining how, what, where, when and with which selves we learn. Prensky (2014) claims that the key is about reforming that what we teach is…"for our kids to get interested in becoming educated" (p.9). He goes on to argue that introducing technology often gives the appearance of moving forward in educating our youth. But in reality, it is just delivering the old curriculum in new ways.

More recently, "partnering" pedagogy such as student-centered learning and problem-based learning seems to work far better. However, the pedagogy still just works better in today's context and with today's students, than the old pedagogy of just "telling." He concluded by proposing Future-oriented education and the curricular reform in four areas of effective thinking, effective action, effective relationship and effective accomplishment (Prensky, 2014).

An innovative futures curriculum should be very open and different in "how we learn" and "what we learn." The intent is also to move participants to other ways of knowing (Wildman & Inayatullah, 1996) so that they may thus gain a deeper and more personal understanding and appreciation of alternative futures (Inayatullah, 2013). Future-oriented learning is specifically vital for young Taiwanese to accomplish the idealism of futures, namely, social and technological innovation, and its overriding quest for a better world. In reality, our students worry more about getting good jobs and making good fortune in the rapidly changing world economy, under the constant threat from China, economically and politically. They are generally concerned more about short-term strategic issues and practical approached to the world. The long-term future does not appear to have any immediate value to these practical young Taiwanese. Likewise, Taiwan's public sectors and most private organizations have not engaged in long-range planning; they prefer to wait for new technologies to be created and produced by others so they can buy them. Once purchased, they find immediate applications for these technologies. They have been content with their secondary role in the world economy (Chen, 2011).

Approaches to Gaming the Future

Clearly, changes in the format of how and what students learn about long-term futures and foresight strategies should be transformed. Serious games might offer easy solutions to enhance learning in forward-thinking and foresight (Dufva, Kettunen, Aminoff, Antikainen, Sundqvist-Andberg and Tuomisto, 2016). They can also be used to help internalize knowledge, communicating and sharing ideas, increasing and broadening participation and creating new futures knowledge (Raford, 2015). Games can create fun and engaging experiences that increase the interaction between participants to the foresight process as well as with the date gathered (Petridis, Hadjicosta, Guang, Dunwell, Bigdeli, Bustinza & Uren, 2015). Furthermore, we can conceptualize individual forward-looking and foresight to be Activities undertaken to foresee the future without the use of standardized foresight methods/tools (Tapinos & Pyper, 2017). It is in this context that gaming the future has become an important tool for teachers at TKU.

Dator (2016) declares that the best way to learn is to do actively, while the worst way is to listen passively. He goes on to elaborate that games are the closest we can come to actually doing the pedagogy of politics and to pre-experiencing alternative futures. Moreover, games are to the social sciences what experiences are to the natural sciences (p.10). While Dator still holds some doubts on games in the fiction-saturated media-driven society that made people hard to separate fantasy from facts, he assumes the best way to do social science research is through repeated games.

A game creates an alternative world, a model world. To explore the world, players interact with artifacts, test ideas, try out various strategies, and adapt to changing conditions as the game

progresses, in their drive to achieve their goals (Gary, Brown & Macanufo, 2010, p.3). Futures games go further than the cognitive or the emotional, rather, they focus on embodied foresight. Drawing from many approaches – gestalt, play, role-playing, board games – a number of games have become part of futures doxa (Inayatullah, 2016). Our goals are to participate, facilitate, and collaborate and to play with students in the classroom world – less lecture, more play.

Research Design and Procedure

This research involves a long period of a five-month academic semester, with over 600 participating undergraduate students spread across eight classes. The exploratory, complex ways of data collection and in-depth participatory observation within natural surroundings qualifies this research as a case study (Yin, 2003). Most of the activities and games we played were originally designed for participants of a small to medium scale group, in a professional or community environment and strong desires to anticipate the future. Quite contrary, our classrooms encounter a number of 75-100+ students within the age range of 18-22, from a variety of majors, particularly with relatively low motivation for learning about futures studies as it is not their major. Some adjustments are made to stimulate an adventurous futures journey full of effective learning progressions and outcomes. The core idea of this innovative futures curriculum design is to engage and reward students for their participation. We started the game-storming process; by involving students to start to imagine the world, creating game worlds to explore and examine personal and social challenges, to collaborate and to generate insights about many possibilities they may find there.

The map of this futures gaming journey adopts the Six Pillars foresight process Inayatullah created (2008). According to Inayatullah, it is designed to make it easier for participants to gain insight into the social reality generally and foresight specially. Within the guiding map, the boundaries among social, technological, economic, environmental, and political (STEEP perspective) are integrated. We design the processes to be flexible and to keep the goals fuzzy since futures are uncertain. Often times, we are exploring alternative actions while experimenting, and trial and error.

Game 1: Personal Futures - exploring images of the future

The purpose of this game was to immediately engage the students to think about their own future in a very real and personal level rather than start the introduction to futures studies on an abstract level. This game was inspired from Wheelwright (2010) in his book "It's your future… Make it a good one". At the beginning of the course, students are given some of the foundational ideas about futures studies, and for the purposes of this activity an explanation that our own story about the future determines what actions we will take in the present in order to shape our own futures.

The activity starts with discussing images of the future and the consequences those images can have on how we perceive the future. Polak's quote, "The rise and fall of images of the future precedes or accompanies the rise and fall of cultures. As long as a society's image of the future is positive and flourishing, the flower of the culture is in full blossom. Once the image of the future begins to decay and lose its vitality, however the culture cannot long survive" (1961, p. 50) is used to elicit not only a personal connection, but one from a cultural aspect as well as this resonates quite strongly with Asian students.

From this discussion on images of the future and their consequences, students were asked to think about their own stage of life and what they wanted most out of life. They were then asked to draw two things (1) an image of an animal that represents him or herself – this is an analogy of their

own personal qualities, perceived strengths and weaknesses and (2) themselves in 20 years time – in 2037. The discussion on their personal images is taken further by asking the student to upload an image of themselves in 10 years time onto the class intranet. It could be either a drawing or image from the internet with some explanation about their image.

Nearly all students (90%) submitted an archetypical image of their future (school, job, marriage, children) as shown in Image 1 below:

1. The future is linear and mostly depends on luck and a good plan. The majority of students share this view. Said one student: *my dream started when I enter the department of civil engineering. I am able to join some great construction project such as Taipei 101. My next step is to preparing for the graduate school and receive construction technician license within 5 years…life is complete.*
   Said another: *future is like climbing up a very long stair. To achieve the goal, you will just have to keep working hard and move forward. The ultimate goal is to own a suburban house, with double income and no kids.*
   And: *To me, future is like a test offered by time. I have to plan for a beautiful family, good friendship, and great career achievement. Most importantly, I have to be able to payback my parents.*
2. The future is an unknown territory. *Future is unpredictable; hence we will have different dreams each and every day,* said one student. Another added: *It is like a game of baseball. You will only know the result when the game is over.* Furthermore: *future is like walking in a dark tunnel and each step onward is an uncertain danger.*
3. The future is predetermined; hence, nothing much we can do about it. Said one student: *future is like the galaxy and we are only one tiny dot in this overwhelmed combination.* Another added: *The future will be dominated by AI and Robots and humanity eventually fades away.*
4. For a few female students, being an executive who could travel while also having a family was another common theme. A desire to 'have it all'. "*On my dream list is to work as a superior manager or leader in an international trade company in the future. Most important of all, I would make a balance between my family and my job. I would spend lots of time traveling around the world with my family*".
   Another said: "*In my image I'm a typical alpha female and manage my company well. Besides, I also have a lovely family and always travel around the world with them or by myself*".
   And: *I would like to work in an international company, being a great leader there. And also, I would have time with my family. Taking good care of my family is the first place in my heart. I could cook for them everyday. Going to travel in the weekend together.*

Figure 1. Archetypical future images of students

Insights of the game

This is the first activity undertaken in the classroom to engage the students to think about their own personal futures. We anticipated that students' assumptions of the future might be deeply challenged when they were asked to envision their most desired future in ten years time. A number of students remarked on how difficult the process was for them to have to think more specifically about what their life might be like. The intention was to encourage the students to think creatively about their future and to convince them that the future is not fixed, nor predetermined. The self-reflection practice was a good way to engage students to use futures methods to explore and plan for their personal futures and get a profound understanding the it is possible for them to change the future through the actions they take in the present.

Game 2: Collaborative Working Style

To complete the activities throughout the semester, the students are formed into a couple of different working groups, each time with new members. As many of the students do not know each other, this can be a very challenging and even upsetting experience, as they must now interact with different genders, people from different departments and even international students. In part to alleviate some of the stress of forming into new groups, we play an activity to identify individuals' preference for different creative problem solving styles (Basadur, Gelade & Basadur, 2013). The students are told that they are going to learn about themselves and do an activity to learn about their 'future making collaborative style'. The four collaborative styles are explained: (1) Generator: You like to start *new things*, gather information, discover new problems or new possibilities; (2) Conceptualizer: You like to *define* problems. Create options in the form of alternate ways to understand and define a problem or opportunity, and good ideas that help solve it; (3) Optimizer: You like to *organize* knowledge and focus on specific problems. Turn ideas into practical solutions; and (4) Implementer: You like to *get things done*. Creates options in the form of actions that get results and gain acceptance for implementing a change or a new idea (Basadur, Gelade & Basadur, 2013). To start the activity, the students are told that all people have to ability to engage in each cognitive activity, but that everyone has a preference. They are then asked to go stand at one of four white boards in each corner of the classroom which has their preferred style of problem solving.

When students have gathered around their respective whiteboard, they are then asked to think of pros and cons for their respective preference. This takes about 15 minutes. The students are then asked to present to the group about their preferred style. The teacher as the facilitator will then ask a few questions to elicit some deeper thinking. For example, after the Generators have explained the pros and the cons of their style, the Implementers are asked from their perspective what makes it challenging for them working with Generators – creativity and new ideas being the biggest challenge. Conceptualizers, Optimizers and Implementers all recognized that they were not good at creating new ideas and not particularly creative, recognized the importance of Generators to the problem solving process.

Insights of the game

After all of the groups have presented, they are asked what they learned by doing this activity. Most commonly students said that, "All are necessary for problem solving" or "it's important to understand the different preferences so that we can work better together", also that "it's similar to the business planning cycle".

Once the students have had a short discussion on each of the attributes of the different preferred styles, they are then asked to form into new groups for their final group assignment with one person from each preference. Additional team building is done by getting them to think of a team name as

well as a list of the values and behaviors they want their team to follow. The experience of going through these team building activities and developing some understanding about different working styles, perspectives and assumptions is a very direct application of the praxis of futures thinking. While the game is not specifically futures related, it is helpful in getting students to relax and self reflect on their own preferred style of problem solving. This has the benefit of bonding the newly created groups and recognizing the importance and value each member can add to the group.

Game 3: Futures Triangle

The futures triangle created by Inayatullah (2008a,b) is for the use of mapping the future. The futures triangle allows those in a particular context to explore the role that the past, the present and the future play in defining what is possible. The result should be that stakeholders perform a futures stock-take in which key elements of their context are understood to be rooted in the past, caught up in present or anchored in assumptions and aspirations deferred to the future (Bussey, 2014). Following Inayatullah's suggestion, we had the game played in skit format. By role-playing the pushes of the future, they can often feel the power of technological and demographic changes, and by role-playing the weight of history, they gain insights into the challenges of organizational and social change. By visualizing and drawing the future, the participants can gain a better understanding of the future they want and, often, of the limits of their imagination (Inayatullah, 2013).

We built four teams, each team choosing a group of actors to play either the pull, push or weight in their drama skit at the closing of the game. To anticipate the future, each group was given the statement "What is the preferred university for your next generation in 2037?" Within each team, groups were discussing, debating, and competing for their ideas to become the most preferred vision. The group that stands out plays the roles of visionary and prepare their vision statements. The remaining two teams chose to play the roles of corporate developer or political bureaucrats. Bonus points were given as the material incentive, in addition to enjoying praise and appreciation from other teams. The teams that stood out were Team Utopia, Team Freedom and Team Winner. Their brainstorming process, final artifacts and skit are shown in Image 2, 3 and 4.

Figure 2. Brainstorming process

Figure 3. Drama skit

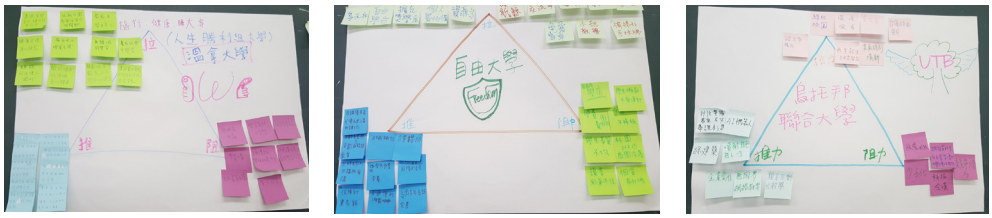

Figure 4. Futures Triangle on Preferred University in 2037

Insights of the game

Because the students know they are going to present a skit on their futures triangle to the class, they become fully engaged in understanding the tensions between the pull, pushes and weights for their preferred university in 2037. They need to make assessments on each of the pushes and weights and determine which are most useful in their presentation, helping to build student confidence in their knowledge of futures studies. One of the most commonly identified weights to change in the university system – at least how it is practiced in Taiwan - is the continued practice of rote book learning and lecture based classes rather than student centered learning and activity based learning or flipped classrooms.

Game 4: World Vision Game (The Three Tomorrows: A Method for Post-normal Times)

John Sweeney of The Center for Post-normal Policy and Futures Studies, created the game called 3T to model the dynamics of post-normal times and provide a more robust methodological framework and approach for futures research (Sweeney, 2015). The game is used to investigate possibilities for what might lie ahead. Scenarios produced using 3T presence emerging issues and are meant to raise previously unthought-of concerns and questions.

Black elephant is an event which is extremely likely and widely predicted by experts, but people attempt to pass it off as a black swan when it finally happens. Usually the experts who had predicted the event – from the economic crisis to pandemic flu – go from being marginalized to being lionized when the problem finally rears its head. In contrast to the black elephant of the extended present (10-15 years), black swans in the familiar future(s), beyond the next 15-20 years, are events that are hard to predict based on historical information - not perceptible or articulated, even by experts,

which is to say that they can and might appear seemingly "out of the blue". After the event has happened however they are deemed retrospectively predictable and make sense in hindsight. The unthought-of future is a space populated with seemingly infinite alternative futures. Black jellyfish are 'high impact,' but they are "normal " phenomena driven towards a post-normal state by positive feedback, or increasing growth toward systemic instability (p.113-114)

After explaining meanings of three animal metaphors, students pick one of the 3T as their topic of discussion. Accordingly, they will answer for six questions: What? Who? Where? How? Impact? And Others? The is the game that really provoked their intense participation, hot debates and creative imaginations. Students are also asked to present their emerging issue and the class then votes on their favorite. The following images are some of the winners.

The black elephant winner shown in Image 5 chose racial discrimination as an issue since the social problem has been existing for a long period of history and people still choose to neglect it. The example was the way some local Taiwanese families are accused of abusing migrant workers from Southeast Asia. The issue will affect everyone in the world and we should develop a sense of justice and sympathy through education. Otherwise, the phenomena of deprivation, abuse, conflict will seem to impact the social-economic and cultural development in future.

Figure 5. Black elephant issue

The blackswan winner was the reconciliation of the Islamic world, to fight against the Christian world, the realization of the "clashes of civilizations" theory (Huntington, 1993). The Islamic world as a whole transformed and moved up to the developed world. We will have to reframe our relationships with Islamic world and develop a collaborative economy. The impact will be huge and not limited to the political and economic sphere. The wild card is the design industry – Hijab and Burkini became the new fashion.

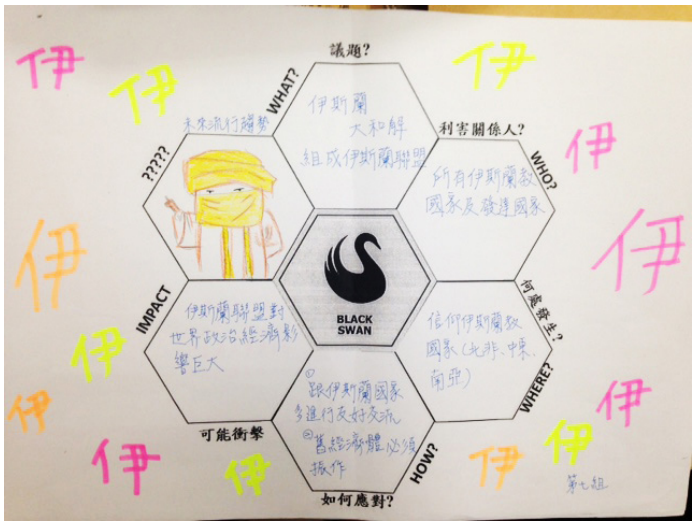

Figure 6. Black swan issue

The black Jellyfish winner is the new breed of "phubber" – a word that combines phone and snubbing referring to a person who interacts more with their phone rather than interacting with a human being. The term has appeared in media around the world, and was popularized by the "Stop Phubbing" campaign. The phenomenon has seemed not just to happen to younger generations but cross generation and society wide and is considered as having a high impact to everyone. The increasing number of people addicted to using smartphones will have impacts on physical and mental health, safety on the roads, disorganized family and the like. Instead of promoting "Stop Phubbing" campaign, we should develop a much more creative and humane communication technologies.

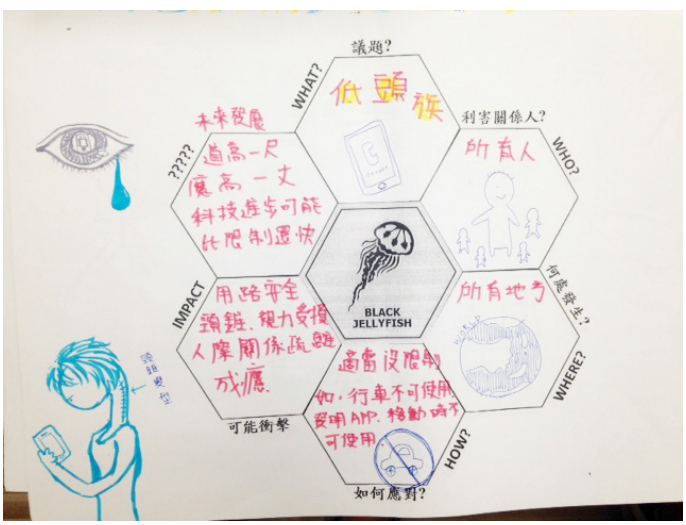

Figure 7. Black jellyfish issue

Insights of the game

We thought that metaphors of animals and theories behind them would be a little too complex for students to comprehend and to play. The outcomes proved us wrong. Students identified significant emerging issues, wild card effects and outcomes of accumulations quite effectively. What was even more surprising was that those issues involve a strong sense of "glocal" perspective which we thought students generally did not show too much concern for beforehand.

Game 5 and 6: Futures Wheel in World Café

The Futures wheel is a method for graphical visualization of direct and indirect future consequences of a particular change or development. The Futures Wheel is a way of organizing thinking and questioning about the future – a kind of structured brainstorming (Glenn, 2009). While the brainstorming process is effective in gathering possible impacts and to put ideas down in a structured way, it sometimes is too intense for a large group of students. To enhance the level of pleasure and relaxation, we combined the futures wheel method with World Café and made the process more game-like. The world café is a method for improving large group discussion by borrowing concepts from the informal "café" conversation that we have all the time (Gray, Brown & Macanufo, 2010).

The original group members will come up with the "What if" assumptions about a future development or trend in the first round, followed by the remaining three 10-minute rounds of group discussion and a group synthesis. After each round, the group leader stays behind to serve as a "host" of the next round, while the rest travel to other tables as "ambassadors." The students felt the sense of having a chance to go "around the world" and bring their ideas with them from table to table. The final sharing presentation is for them to synthesize ideas and to be challenged by other groups. This final presentation was then voted on by the other students to determine which group was able to synthesize the information best. Some of the trend assumptions are list below:

- What if there are no professors?
- What if we live up to 120 years as cyborgs?
- What if alternative energies became major sources of power?
- What if we could control time?
- What if we are able to manipulate genome sequencing?
- What if there are no countries?
- What if we reach an era of mass joblessness?
- What if we could communicate with animals?

We highlight the award-winning intriguing assumption "What if we could communicate with animals (CWA)?" to illustrate the outcomes of this interactive brainstorming process (Table 1).

Table 1. *Futures wheel in action*

	First level Impact	Direct Impact	Indirect Impact
CWA #1	Barter with animals	Acquire precious goods	Got to have pets
CWA #2	Receive warnings of coming disasters	Live close to animals	Got to have pets
CWA #3	To help hearing loss people	Animal iCommunicator	Animal ambassadors
CWA #4	Negotiate alternative food	No meat	Artificial Meat
CWA #5	Zootopia	Co-design living environment	Alternative family
CWA #6	Multicultural education across boundaries of human and animal	Solve the myth of mermaid?	Inquire roaches on the truthfulness of human history

Figure 8. Activities in games of futures wheel within world Café

Insights of the game

The most essential element to link these two games was "fun." We as the facilitators turned into exciting participant observers. Students enjoyed playing the role of "ambassador", travelling from table to table to discuss new topics and discuss the consequences of their 'what if' questions. The "hosts" who stayed at the table got the chance to listen, learn, and practice the mindset of leadership. Another key element we found was the magic power of diversity. Students were able to identify trend issues in the first round but often got lost in linking to possible consequences. The role play of being "host" or "ambassador" did successfully bring in fresh and clear ideas to the following rounds. That momentum of brainstorming continued to the end since everyone eager to see which of their input in various groups won in the process of competitive collaboration.

Game 7: Time Machine

After the games of mapping and anticipating the future, we moved on to the third level of the six pillars – Timing the Future. The perfect game to play and to give a deeper understanding of the third pillar is the Sarkar Game, invented by futurists and academics Joseph Voros and Peter Heyward (2006). Inayatullah (2013) emphasizes that even while Sarkar posited a cyclical theory of social change, his intent was to create a new form of leadership that could transform the cyclical to the spiraling, wherein the patterns of the past are transformed for a progressive future. Yet, we haven't played the Sarkar game with students due to the space constraint.

Alternatively, we played the Time Machine game created by Mei-mei Song, our colleague of futures graduate program, Tamkang University. The game has been played with various groups in educational, public, business and non-profit sectors. The game design is easy, yet with a quick

inspiring effect on changing participant's image of time regarding patterns of change. The game starts from showing images of significant inventions, events, figures, fashion and media of the present (22 years ago). Twelve groups of students are assigned to 'live' in the year of 1985 or 2017.

Instruction for students of 1985:
There is a time machine approaching, carrying several individuals from Year 2017. It will stay for 10 minutes. You are allowed to ask questions, with only yes or no answer, to know more about the development of the world in that future time.

Instructions for students of 2017:
Our time machine is approaching Year 1985. Please be prepared to land and stay for only 10 minutes. You are allowed to share with people some of the most significant innovations and achievements of our world.

Some notable questions collected from 1985:
1. Is there a cure for cancer?
2. Have we become immortal?
3. Have we united Mainland China?
4. Has a nuclear weapon been used in wars?
5. Have we invented better ways to deal with nuclear waste?
6. Is Mars travel and settlement now possible?
7. Is Taiwan under sea level caused by global warming?
8. Can we see snow on the ground?
9. Is same-sex marriage legal in Taiwan?
10. Can men be pregnant?

Major innovations and achievements in 2017:
1. We have invented exciting communication tools, such as smart phone, Wifi, VR/AR/MR.
2. We have saved travel time by taking Mass Rapid Transit and Hi-speed rail.
3. We have started creating Internet of things and unmanned cars.
4. Medical procedures of organ transplants and plastic surgery are becoming safer.
5. We elected the first female president of Taiwan, while Trump became president of the US.
6. Industries of solar power and alternative energy have gradually rising.
7. Taiwan is the first country that legalizes same-sex marriage in Asia.
8. We have experienced a couple of global financial crisis.
9. Sharing economy is gradually emerging
10. Virtual currency –Bitcoin- has become popular.

Insights of the game

We found contradictions between students' questions and innovations. As most of the young students worry about getting a good job and making lots of money, they rarely raise questions from the perspective of the economy. Yet, they are quite curious about structural changes from other aspects such as technology, society, politics and environment. It seemed like the image of the future twenty from now does bring about their deeper metaphors toward the future. In a way, the game plays like a form of narrative theory, helping individuals move away from unhelpful and distressing storytelling towards stories that shape their identities and relationships in line with the possibilities of desired presents and futures (Milojević , 2015). One student commented after the game "it is far beyond my expectation that things can change so drastically in merely 20 years of time." And added another "I am still in quite a shock of what could have been done just in a blink of time."

Game 8: Causal Layered Analysis game (Headline News)

This game was inspired by an article in the digital exhibits of the *Journal of Futures Studies* (JFS) titled "Odd Studio's Cultureberg: Causal Layered Analysis meets Design" (Odd Studio, 2016). Odd Studio was a future-focused design and research studio looking for a methodology which could be used in the design process. Recently designers and design studios have become "increasingly concerned about: (a) the influence that their designs have on society, and (b) the influence that political, economic, social, and technological factors will have on consumers, citizens and future users" (Odd Studio, 2016). Odd Studio found that the application of Causal Layered Analysis (CLA) would allow designers to better visualize preferable and non-preferable future scenarios so that they can have a clearer understanding of how their designs might influence people, ultimately helping them to determine what should, or possibly should not, be designed (Odd Studio, 2016). CLA works on four levels: (1) the litany or the official unquestioned view of reality, (2) the social causation level, or systemic perspective, (3) the third level is the discourse/worldview. Deeper, unconscio usly held ideological, worldview and discursive assumptions are unpacked at this level. As well, how different stakeholders construct the litany and system is explored, and (4) The myth/metaphor level of the unconscious emotive dimensions of the issue (Inayatullah, 2008a).

The Tamkang University students were asked to focus on the first level of CLA the litany: WHAT is happening now? They were able to first choose any particular theme and turn these issues into headlines. In this way the subject matter can be understood from the human perspective, exploring actions and events on the ground level (Odd Studio, 2016).

After students created their headline news, they explained it to the class and the class was able to vote on their favorite headline news. Below are some of the winners.

Figure 9. Headline News: The earth is sick

Symptom 1: sneezing – rising sea level
Symptom 2: fever – global warming
Symptom 3: coughing – increased CO2 emission

Figure 10. Headline News: "Water holds up the boat, water also sinks the boat."

As Dator (1995) put in his 3rd law of the future "We shape our tools and thereafter our tools shape us." Everything is connected; hence, technological change triggers social, economic and environmental change. The global society is now enjoying the convenience that ICT brings, while worrying about the increase in cybercrime, human degeneration and traditional cultural artifacts.

Figure 11. Headline New: Silent spring

Rethinking the costs of growth ideology:

- Extreme weather became constant
- Extinction of species
- Disappearing "lands" for human and polar bears

Insights of the game

Creating headline news and debating on the day-to-day experiences to reflect the complexity of society allows the students to bring together a coherent story of problems and emerging issues. Although the students only completed the first layer of CLA, the process gave them a deeper

experience in the process of understanding how current issues and problems are framed through the news of the day. They also needed to ensure that their headline was relevant and informative to capture the consideration of the other students. In workshop setting and in research CLA is often completed in a table form. By using the Odd Studio (2016) process of using blank newspaper templates, the methodology becomes more creative and visual.

Discussion

Some key learnings from our experience with using gaming and gamification at Tamkang University are discussed below.

Safe spaces for experimenting with ideas

Engaging students in class for futures studies has often been a challenge at Tamkang University. The students are required to take one futures studies course in completion of their major and they often do not see the relevance to why futures studies would be important to know for a Spanish major for example. The classes are big and the subject matter too esoteric for many. The only future most students care about is getting a job. The introduction of a workshop style classroom and minimal lecturing from the teacher is at first treated with suspicion by the students. At first they are concerned with having the 'right answer', but when they begin to experiment and share knowledge with their group, begin to have serious discussions of some of the major issues of the day, and also begin to think more deeply about the consequences of these issues they become engaged and eager to participate in classroom discussion. The world is changing and more uncertain than before, creating an innovative and inclusive space for the students to learn in our experience has encouraged students to take risks and express their creativity.

Language is important

Some of the language of the futures methodologies had to be changed to improve the students' understanding and move away from some cultural blockages. The futures triangle methodology uses the term 'weight of the past' as one of the dimensions of the triangle. Words like 'tradition' and 'history' are used to describe the weights and to many Taiwanese students they have a very limited and specific view of what these words mean to them. An example would be when a group is doing a futures triangle on the low birthrate in Taiwan and the weights would be a history of when Taiwan was ruled under the Qing dynasty – not particularly relevant. We changed 'weights' to 'obstacles' and with exactly the same explanation of what this means, the students were able to understand and map the competing dimensions of the future in a more reasoned way.

Students like to play

We believe that teaching futures studies should not be chained to teacher directed learning and although there are challenges with large students numbers, lack of resources and even student apathy; the freedom for students to creatively learn and try new things has been enthusiastically received. There have been times when the class lesson is a bit messy and the teachers have needed to improvise to achieve the lesson goals. The students are able to laugh, move around, present, compete, create, question, draw, act, argue and experience the future through deep participation. For student and teacher this is a much more enjoyable way to learn even some of the more abstract ideas of futures studies.

Concluding Remarks

Our experience with gaming at Tamkang University is that it engages the students in a way that traditional teaching methods do not. While this may sound obvious, because Futures studies is a required core curriculum course for all undergraduate students, not all are willing participants and the students are sometimes resistant to wanting to learn anything outside their major subjects, as they do not see the relevance. The experimental-innovative game-based futures curriculum design supports the words of Jim Dator in the opening keynote of Gaming the Futures conference (2016), quoting Marshall McLuhan, "anyone who tries to make a distinction between education and entertainment doesn't know the first thing about either." However, we are not merely trying to entertain the students as much as engage them through relevant and experiential learning opportunities. We recognize that creating an atmosphere of fun and engaging the students gets students interested in the world around them (Katz & Chard, 2010). This then provides young students the opportunity to recognize the interaction between their own understandings of the world as it is now and the vision of what it might become (Mallan & Greenaway, 2011). Image 12 is one of the creative works student submitted as final assignment and it may prove that young students have started to deconstruct and transform the form and expression of final paper.

Figure 12. A work of final term paper using scenarios and futures triangle

Despite all the massive technological, demographic, social and cultural changes our world has seen over the past centuries, education process, by and large, remain 'stuck' in the 19th or 20th century paradigm (Milojević , 2014). We are constantly experimenting with new ideas on how to engage and involve students in the learning process. We have observed that through gamification students are more personally engaged with futures thinking and are excited to contribute in class; and actually might learn something. The learning process for us teachers is enhanced as well. We enjoy the challenge of making our classrooms more fun, engaging and experimental; and ultimately generating new ideas, adapting and learning right along with the students.

Correspondence

Kuo-Hua Chen, PhD (corresponding author)
Graduate Institute of Futures Studies,
Tamkang University, Taiwan
E-mail: sochen@mail.tku.edu.tw

Jeanne Hoffman, PhD
Graduate Institute of Futures Studies,
Tamkang University, Taiwan
Managing Editor, Journal of Futures Studies
E-mail: jeannehoffman71@gmail.com

References

Basadur, Min, Gelade, Garry., & Basadur T. (2013). Creative Problem-Solving Process Styles, Cognitive Work Demands, and Organizational Adaptability. *The Journal of Applied Behavioral Science, 50*(1), 80-115.

Bussey, M. (2014). Concepts and Effects: Ordering and Practice in Foresight. *Foresight*. 16(1):1-16.

Chang, Clement C. P. (1998). Three Decades of Futures Studies at Tamkang University. *Futures Research Quarterly,* 14(3), 88-96.

Chen, Kuo-Hua. (2011). Futures Studies in Asia Pacific: The case of Taiwan. *Ekonomiaz: The Basque Journal on Economics*, 76, 124-143.

Dator, J. (1995). What futures's is and is not. Retrieved 14 November from http://futures.hawaii.edu/publications/futures-studies/WhatFSis1995.pdf

Dufva, M., Kettunen, O., Aminoff, A., Antikainen, M., Sundqvist-Andberg H., & Tuomisto, T. (2016). Approaches to Gaming the Future: Planning a Foresight Games on Circular Economy. International Conference on Games and Learning Alliance. p. 560-571.

Gary, Dave, Brown, Sunni, & Macanufo, J. (2010). *Game Storming: A playbook for Innovators, Rulebreakers, and Changemakers*. Sebastopol, CA: O'Reilly.

Glenn, J. C. (2009). *Futures Wheel*, Futures Research Methodology Version 3.0, The Millennium Project, Washington, D.C.

Hayward, P., & Voros, J. (2006). Playing the Neohumanist Game. P. p. 283-296 in Sohail Inayatullah, Marcus Bussey and Ivana Milojević (eds.) *Neohumanist Educational Futures: Liberating the Pedagogical Intellect*. Taipei, Taiwan:

Hoffman, J. (2014). Alternative futures of China: A macrohistorical approach. *Futures*. 57 (2014): 14-27.

Huntington, S. P. (1993). The clash of civilizations? *Foreign Affairs*; Summer 72(3): 23-49.

Inayatullah, S. (2016). Gaming the Future(s): Pedagogies for Emergent Futures. Conference brochure. P3. Tamkang University.

Inayatullah, S. (2013). Using Games to Understand the Patterns of the Future – The Sarkar Game in Action. *Journal of Futures Studies, 18*(1), 1-12.

Inayatullah, S. (2008a). Six Pillars: Futures Thinking for Transforming. *Foresight, 10*(1), 4-21.

Inayatullah, S. (2008b). Mapping Educational Futures: Six Foundational Concepts and the Six Pillars Approach in Bussey, M., Inayatullah, S. and Milojević , I. (eds). *Alternative Educational Futures: Pedagogies for Emerging Worlds*. Rotterdam: Sense Publishers.

Katz, L. G., & Chard, S. C. (2000). Engaging children's minds: The project approach (2nd ed.). Stamford, CT: Ablex.

Mallan, K., & Greenaway, R., (2011). School, Images of the Futures and Social Processes in Classrooms. *Futures,* 43, 374-386.

Milojević, I., & Inayatullah, S. (2015). Narrative Foresight. *Futures,* 73, 151-162.

Milojević, I., & Izgarjan, A. (2014). Creating Alternative Futures Through Storytelling: A Case Study from Serbia. *Futures*, 57, 51-61.

Petridis, P., Hadjicosta, K., Guang, V. S., Dunwell, I., Bigdeli, A., Bustinza, O. F., & Uren, V. (2015). State of the Art in Business Games. *International Journal of Serious Games,* 2, 55-68.

Polak, F. (1961). The image of the future. Vol. 1., Elsevier Scientific Publishing Company. p. 50

Prensky, M. (2014). The World Needs a New Curriculum. *Educational Technology, 54*(4), 3-15.

Prensky, M. (2013). Our Brains Extended. *Educational Leadership, 70*(6), 22-27.

Raford, N. (2015). Online Foresight Platforms: Evidence for Their Impact on Scenario Planning and Strategic Foresight. *Technological Forecasting and Social Change,* 97, 65-76.

Stevenson, T. (2004). Clement C. P. Chang: bringing foresight to Taiwan. *Futures*. 36:921-31.

Sweeney, John A. (2015). Infectious Connectivity: Affect and the Internet in Postnormal Times.

p.107-122 in Winter, Jenifer, and Ono, Ryota. (Eds.) *The Future of Internet: Alternative Visions*. Springer.

Tamkang University. http://english.tku.edu.tw/about/index.html

Tapinos, E., & Pyper, N. (2017). Forward Looking Analysis: Investigating How Individuals "do" Foresight and Make Sense of them. *Technological Forecasting and Social Change*. Article in press. http://dx.doi.org/10.1016/j.techfore.2017.04.025

Wheelwright, Ve. (2010). *It's Your Future… Make it a Good One*. TX: Personal Futures Network.

Yin, R. K. (2003). Case Study Research: Design and Methods. Sage.