# iPodia: Borderless Interactive Learning

Stephen Lu*
Viterbi School of Engineering
University of Southern California
sclu@usc.edu

Ang Liu
Viterbi School of Engineering
University of Southern California
sclu@usc.edu

**Abstract**

*The 21st century higher education is rapidly evolving towards a vastly different shape influenced by the global trends of industrialization of institutions, increase of education supply, underwater college degree, and student's changing demands of learning. This paper introduces a new "Classrooms-Without-Borders" paradigm of global education, called iPodia, which aims to support borderless interactive learning. The iPodia pedagogy features with "inverted", "interactive", and "international" learning to enable students around the world to learn with, and from, each other collaboratively as cohorts in a virtual classroom. The iPodia Alliance, which was established in 2012 as an independent global consortium among nine leading higher education institutions, enables various iPodia courses to be collaboratively developed and jointly offered by multiple iPodia university partners. Unlike the current distance education approach where IT is used to enlarge the delivery distance from teachers to students, iPodia demonstrates a no-distance education model where IT is employed to eliminate the learning distance between students in remote classrooms. Based on the flipped classroom model, iPodia and MOOC can provide students with the best combination of educational resources, because they can both learn subject contents from the best global teachers (i.e., via MOOC) and develop subject contexts with the best global peers (i.e., via iPodia).*

## 1. Introduction

Yes, the world is becoming flat, as Thomas Friedman suggested [1]. However, we believe that until the world of learning becomes flat, the world cannot be true flat! The rapid advancements of globalization and technology over the past few decades have significantly changed the landscape of higher education in the 21st century, leading to many new learning possibilities beyond what we know of to date. The traditional teaching/learning paradigm that mainly focuses on content lectures is now being greatly challenged by the sweeping MOOC (i.e., massive open online course) movement which makes content courses available to all learners free of charges. All learning institutions, which draw tuitions from students by offering classroom lectures on campus, must now find a new value proposition to sustain their campus education. In the global context, every leading university encounters similar challenges and opportunities: how to create new values beyond traditional lectures for on-campus learning, how to overcome the paradox posed by the tension between global demands and local constraints, and how to deliver high-quality global education right from one's local campus? Rather than engaging in a "red-ocean" price-competition with distance education, which will drive everyone to the bottom, we believe that all learning institutions should employ a "blue-ocean" strategy to focus on the "no-distance education" that features borderless interactive learning across physical, institutional, and cultural boundaries.

This paper introduces our efforts over the past five years to develop a new "no-distance education" model as a blue-ocean innovation strategy to address the current

challenges of higher education. iPodia, where the letter "i" stands for "inverted", "interactive", and "international" learning, and the word "podia" is the plural of podium, is developed based on three pedagogical hypotheses: (1) contextual understanding can be achieved by learner interactions - hence the "inverted" learning, (2) what you learn depends on with whom you learn - hence the "interactive" learning, and (3) diversity can increase the learning opportunity for everyone - hence the "international" learning. Based on this iPodia pedagogy, an independent global consortium among 9 global leading universities, called the iPodia Alliance, has been established to promote a fundamental transition from the current distance education to the future "no-distance" learning. Unlike MOOC which mainly focuses on content lectures with enhanced teacher-to-student interactions, iPodia enables high-fidelity and peer-to-peer interactive learning to achieve contextual understanding. As most lecture courses become free and many college degrees are underwater today, iPodia can become a new value proposition of campus education for 21$^{st}$ century universities.

The rest of this paper is organized as follows. Section 2 elaborates some global trends of higher education and explains why the no-distance education is a blue ocean innovation strategy for leading universities. Section 3 introduces a successful example of no distance education – iPodia in regards to its pedagogical foundations and practical applications. Section 4 summarizes our lessons learned to date and foregrounds potential developments in the future.

## 2. Global Trends of Higher Education

There are four global trends that are impacting the future of higher education: (1) the learning institutions have been experiencing a mass industrialization process; (2) the ubiquitous application of technologies leads to an increasing supply of free lecture courses; (3) the world economic recession causes many college degrees to dive underwater; and (4) there emerges new demands towards campus education from student's perspective.

Looking back in history, a 19$^{th}$ century university was a place for a few top scholars (the masters) to create new thoughts that led the development of humanity and society and form them to nurture the few elites (the pupils) closely and continuously. Whereas, a 20$^{th}$ century university has become a very different place where many professors do their specific R&D projects to satisfy market needs (i.e., very much like a development company) and to lecture many students in large classrooms for university degrees (i.e., similar to a certification bureau). What has happened in the last century is that universities have gone through a fundamental transformation in which a strict standardization and mass industrialization process took place in order to serve the many and save the money. When industrial models, criteria, practices, and management structures are applied to universities, the key stakeholders and activities that exist on university campuses become quite similar to their counterparts which occur inside a factory. In a sense, a university campus today operates much like a mass production factory, where different standard products are being produced via routine production processes. After students (i.e., raw materials) are admitted into a college (i.e., a factory) through a competitive selection process, they are guided (i.e., produced) by teachers (i.e., factory workers) to acquire certain knowledge (i.e., product functions) by taking courses (i.e., production process) each semester. Depending on the specific degree requirements (i.e., projected market demands), a core curriculum (i.e., a predetermined assembly

process) must be followed strictly to constitute an area of specialization. The examinations of student's competitiveness in courses become the quality control steps taken for each production step as a way to judge their preparedness and readiness in the job market (i.e., selling prices of a product on the market).

The above analogy between current university and modern factory, even though a bit cynical, goes beyond just stakeholders and activities. In fact, many of the present eLearning efforts that are taking place in university campuses are quite analogous, in both sprite and implementation, to the industrial automation movement that occurred in many factories in the last century. During the 80s and 90s, under the goal of serving the many and save the money, many factory owners adopted computer technologies (e.g., CAD, CAE, robots) to automate existing factory operations with the hope to boost productivity, reduce costs, improve quality, and increase profits. Only after huge initial investments led to disappointing outcomes, they started to understand that using technologies to automate existing products without updating/improving production process is not a viablestrategy to win market competitions. Interestingly, the same thinking happened, and hence the same lesson can apply, to universities here. In the late 90s, driven by the same goal of serving the many and saving the money, many learning organizations ported their classroom courses for online delivery to distance students. New eLearning technologies are used to automate the classroom lectures based on the same old pedagogy - similar to early factory efforts in using technologies to automate the product (i.e., lectures) without improving the process (i.e., pedagogy). The lesson from factory here is quite obvious for university, that automating courseware with new technology without developing new pedagogy is not a viable strategy.

Since most universities now operate like product factories, let us now use some very basic principles that govern the supply-demand decisions on competitive markets to examine what has happened (or will happen) to universities. From the supply viewpoint, the rapid development of eLearning technologies in the past few decades has dramatically increased the education supply. Every time a new technology (i.e., radio in the 50s, TV in the 60s, satellite in the 70s, Internet in the 90s, mobile technology in the 2000s and eventually cloud computing in the 2010s) is applied, the education supply (e.g., courseware) in terms of speed, distance, and scale is drastically increased. As a consequence of more and cheaper education supply, free high quality courses are becoming a reality and widely available to all. The recent popularity of the MOOC movement that features flexible scalability and open access is the best demonstration of such a trend on the supply side. It should be noted, however, the vast majority of these increased education supplies to date have focused on the same type of learning demand – how to deliver content lectures to the many in the most timely and cost effective manner. In other words, the pedagogy behind these e-courseware remains mostly unchanged despite of the impressive developments of technology enhanced learning.

While the supply side is enjoying a vast expansion, the demand side of higher education is experiencing a series stagnation as an ensuing consequence (or a chain reaction) of the housing bubble, financial crisis, economic recession, and global depression. The rapidly shrinking job opportunities and increasing college tuitions lead to a major financial crisis in student loans. This so-called "higher education bubble" is drawing increasing attentions in recent years. As an example, Figure 1 illustrates a comparison of annual increase rate between college tuition, medical care, home price, and consumer price index (CPI) from 1978 to 2011. It is clear that the increase of

education price significantly outpaced the rest even including the recently busted housing bubble. Such a dramatic increase of price together with a rapid shrinking of middle class worldwide leave college students no choice but to increase their student loans respectively. As a matter of fact, the national student loan debt has almost tripled during the past eight years. On the other hand, nevertheless, the increase of job opportunity could not match the increase of education price partially due to the global depression and partially because of the insufficient education system itself. Such an unbalanced development trend inevitably results in the "underwater" college degrees. This is to say that, unlike before, a college graduate with a degree certification is often unable to find a satisfactory job that pays off his or her education debt in a short period of time. The fact that the unemployment rate of new college graduates remains at a high level is the best evidence of this trend [2].
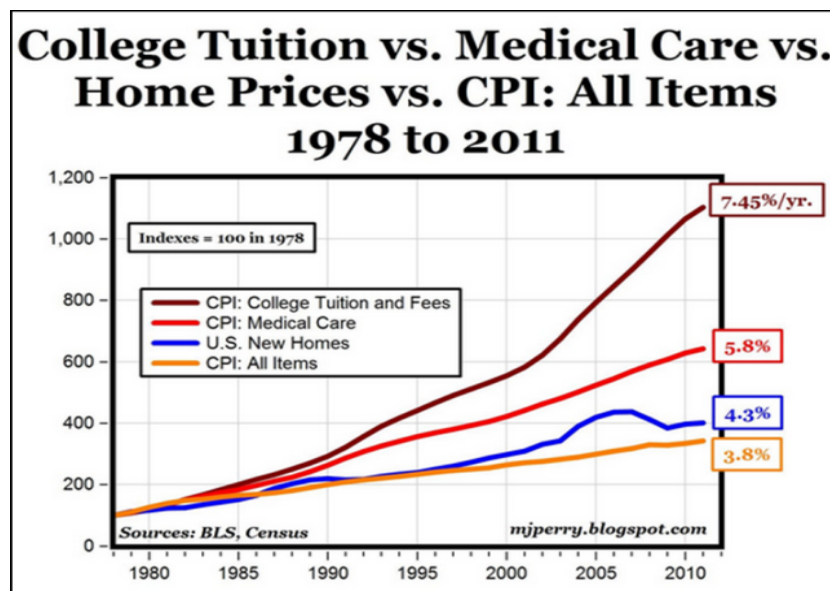


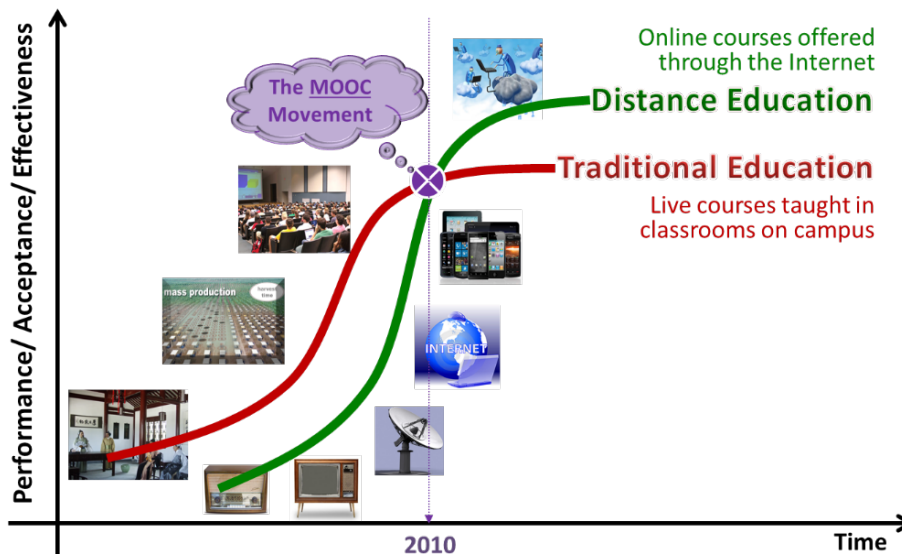Figure 1. An illustration of higher education bubble [3]



Figure 2. S-curves of traditional education and digital education

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The increasing supply and decreasing demand together leads to an interesting question: will digital education be the saver (or a silver-bullet) of future higher education? Figures 2 illustrates the S-curves of traditional education and distance education. As the market of traditional education (the red curve) shows clear signs of being saturated, the digital education (the green curve) is gradually accumulating more momentums in the meantime. Many people believe that the arising MOOC movement is exactly the strategic inflection point [4] where the digital education S-curve will penetrate that of the traditional education. In that scenario, all leading universities encounter similar challenges: how to sustain itself in the sweeping trend of MOOC movement and how to transform its on-campus learning activities to meet new market demands?

To win market competitions, a better strategy is always to create a blue ocean of new demands rather than competing in prices with other suppliers in a red ocean based on existing demands [5]. In the realm of higher education, the red ocean refers to the conventional teaching/learning paradigm, in which a student learns content knowledge from teachers on a college campus via individually attending passive lectures [6]. We believe that one possible blue ocean strategy lies in the new paradigm of no-distance education, in which students develop unique contextual understandings from interacting with their peer classmates in the virtual classroom via collaboratively accomplishing team exercises and tasks. Instead of competing with traditional education and digital education in the red ocean, we argue that a learning institution should invest in developing the no-distance education capabilities to boost the borderless interactive learning opportunities for their students across physical, institutional, and cultural boundaries. Compared to the traditional education and conventional digital education which both focus on creating a resource or a space to attract others to come to learn, the unique values of no-distance education lie in the intercultural peer-to-peer interactions within a shared global context.

## 3. An Example of No-Distance Education - iPodia: Borderless Interactive Learning

### 3.1 iPodia Pedagogy
This section introduces a successful example of the no-distance education model - iPodia, where the "i" stands for "inverted", "interactive", and "international" learning. The fundamental pillar of iPodia is its innovative pedagogy developed based on three basic hypotheses about effective learning: (1) contextual understanding is best achieved via student interactions - hence the "inverted" learning, (2) what you learn depends on with whom you learn - hence the "interactive" learning, and (3) diversity can increase learning opportunity for all - hence the "international" learning.

In regards to the first hypothesis, context is what one uses to make sense of content while learning and practicing. Unlike content, which can be taught by teachers with lectures, contextual understanding is co-constructed when learners (i.e. teachers and students) engage with each other over time. In a conventional learning processes, students sit through lectures on content and are then asked to exercise problem solving at home and left to develop contextual knowledge by themselves. iPodia inverts the traditional schoolwork and homework process by having students first watch online lectures at home to learn subject content before attending classes to engage in various collaborative activities with their classmates to develop contextual understanding (see Figure 3). iPodia employs this inverted learning process to support the first hypothesis, thereby creating a

new value proposition for campus education, turning away from content-based lectures and towards nurturing context for more effective education. Inverted learning (or flip teaching) is a simple idea that has profound implications. The idea of "flip teaching" (or "flipped classroom") is not completely foreign to the education community [7]. But only until recently is it drawing more attentions than ever before due to the increasing popularity of MOOC movement. In the past, relatively few research efforts have been devoted to investigate its impacts on student's learning effectiveness especially in specific to no-distance education in a cross-cultural environment.
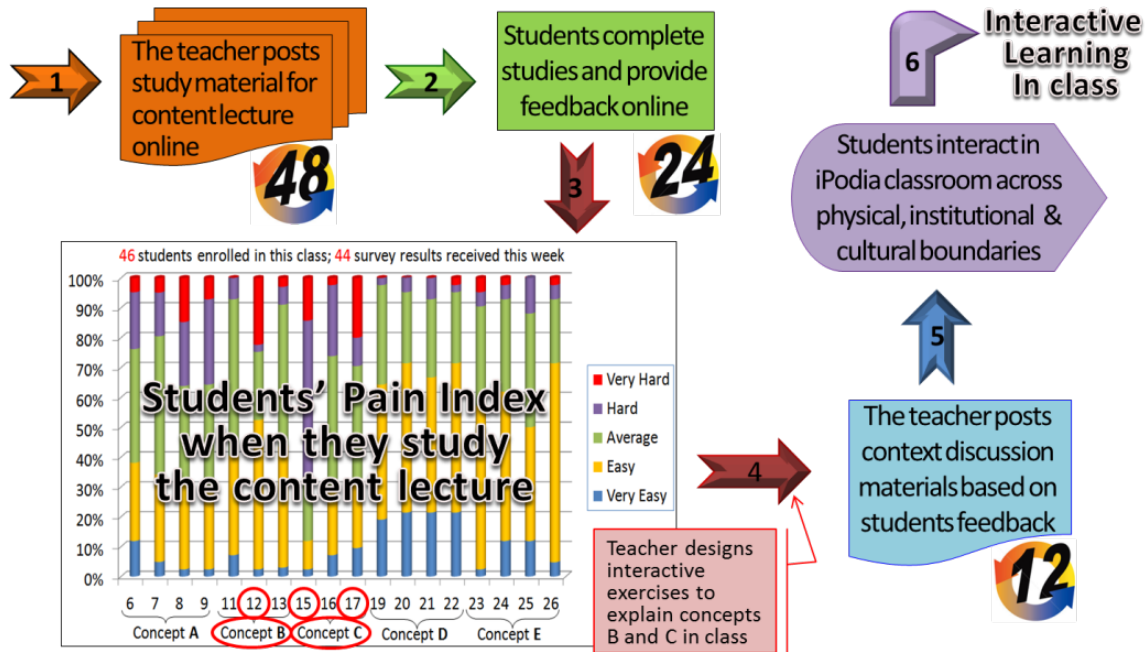


Figure 3. A typical "inverted learning" process in iPodia classes

The second hypothesis is a corollary of the first one, and states that subject content can be learned "from" teachers (or textbooks) but contextual understanding is best developed "with" peers. Thus, the kind of context students can learn from depends on, to a large degree, the peers with whom they are studying with. The inverted learning process explained above transforms the learning paradigm from passive (i.e., be lectured at) to interactive (i.e., to participate in). By turning the "learning-from" pedagogy into a "learning-with" pedagogy, iPodia takes the active learning approach [8] one step further by emphasizing the interactive learning. iPodia enables interactive learning across geographical, institutional, and cultural boundaries, thereby overcoming the strategic irony of global experience versus local value for institutions of higher education. The unique values of interactions in the educational process have long been recognized and elaborated by many past studies [9]. According to Anderson's extension [10] of Moore's traditional classification of interactions [11], there exist six types of important educational interactions: student-teacher interaction, student-content interaction, teacher-content interaction, student-student interaction, teacher-teacher interaction, and content-content interaction. Compared to the traditional learning paradigm that mainly focuses on student-teacher and student-content interactions, iPodia also highlights the importance of student-student and teacher-content interactions. On one hand, various class activities

(e.g., case study, cross-cultural exercise, class debate, etc.) are intentionally designed to encourage and facilitate iPodia students to acquire the unique contextual understandings by means of interacting with their peer classmates. On the other hand, iPodia instructors are also required to constantly modify their lecture content (e.g., presentation slides) based on the most updated feedback from students during the "inverted learning" process (see step 4 in Figure 3).

The third hypothesis is built upon the second one, because if "what students learn depends on with whom they learn", then it is reasonable to hypothesize that student's learning opportunity will be increased when they study with a diverse group of learners from different social and cultural backgrounds. Beyond the traditional inter-disciplinary focus, iPodia further expands to the inter-cultural learning by linking multiple interactive classrooms located in different countries and cultural regions around the world. This new international dimension enables all iPodia students to interact with, and learn from, global classmates right from their own campus. Global education should lead to a mutually deepened understanding of global culture. International students who pursue degrees on foreign campuses are often overwhelmed by the local culture, and can therefore be ineffective in engaging in balanced cultural exchanges that benefit their local classmates. It is difficult to develop meaningful cultural insights through short-term overseas studies, and time away presents challenges for returning students re-entering their regular curriculum. In light of the widely held belief that global travel is necessary for globalization, the question then becomes: is there a better model for future students to enjoy global higher education without leaving home? iPodia uses the high-bandwidth Internet connectivity and existing video-conferencing technology to bring teachers and learners around the world together in the same virtual classroom: it enables teachers to instruct together via joint lectures, and learners to study together via direct interactions.

iPodia opens many isolated and repeated classrooms among multiple institutions. This is, in both concept and spirit, a "Classrooms-Without-Borders" paradigm. iPodia changes the current higher education systems in at least two fundamental ways. First, by polling multiple remote classrooms and separate instructors together, it transforms the present-day ecosystem of university from the "vertical integration of doing everything in house under one roof" to a horizontally coordinated paradigm much like the "foundry" model that revolutionized the semi-conductor industry. Second, by collocating learners from multiple institutions with diverse cultural and social backgrounds to form collaborative learning cohorts, it uplifts the downward proposition of today's university from the serial lectures of knowledge contents by a few teachers locally to a cyclic co-construction of knowledge contexts, as well as mutual understanding of each other, among many students globally.

## 3.2 iPodia Alliance

Based on the above iPodia pedagogy, University of Southern California initiated the iPodia Alliance in 2012 as an independent, not-for-profit, global consortium among leading universities to promote the new "classrooms-without-borders" paradigm for the 21$^{st}$ century higher education. All collaborating iPodia institutions retain their independent identities, degree programs, and curriculum requirements; and work together strategically to develop new courseware and deliver joint classes via the Internet-based iPodia platform to address important socio-technical subjects and significant global challenges. The seven initial founding members of the iPodia Alliance include:

- University of Southern California (USC) in Los Angeles, USA
- Peking University (PKU) in Beijing, China
- National Taiwan University (NTU) in Taipei, Taiwan
- Korea Advanced Institute of Science and Technology (KAIST) in Daejeon, S. Korea
- Israel Institute of Technology (Technion) in Haifa, Israel
- RWTH Aachen University (AACHEN) in Aachen, German
- India Institute of Technology - Bombay (IIT) in Mumbai, India

USC, through its Viterbi iPodia (ViP) Program Office, serves as the iPodia Alliance' current administrator to coordinate academic and administrative affairs among members. The Escola Politécnica da Universidade de São Paulo (EPUSP) in São Paulo, Brazil and the Birla Institute of Technology & Science, Pilani - Hyderabad in India joined the iPodia Alliance in 2013 as the $8^{th}$ and $9^{th}$ members. A few more elite institutions in other major world cultural regions, such as the Middle East, Africa, Russia, etc., are being invited to join the iPodia Alliance to enrich transcultural learning opportunities for all. In addition to the resulted cultural diversity, a developed iPodia Alliance is also an important precondition to break the limitation of different time zones on the no-distance education paradigm. Unlike the traditional distance education, the iPodia classes feature with synchronized interactions between students located in different places on the world. We believe that the physical distance can be eliminated by the advance of IT, whereas the time zone difference can be addressed by the participation of more institutions, the offering of more courses, and eventually a fully connected global curriculum network. The long term goal of iPodia Alliance is to include at least one world leading institution in every time zone, so that whenever a student walks into an iPodia interactive classroom in his or her own university campus, there is always a synchronized class with different classmates in different time zones and diverse cultural regions awaiting for him or her to join. For instance, in an existing iPodia course namely "Principles and Practice of Global Innovations" which is jointly offered by USC, KAIST, PKU, Technion, and AACHEN in the 2013 spring semester, American students located in the USC campus are able to learn together with German and Israelite students in the morning but with Chinese and Korean students in the evening of the same day.

There are three principles that govern the operations of the iPodia Alliance. First, the "equal-reciprocity" principle encourages members to strive for balance between iPodia courses offered to and received from the Alliance within a certain period. This ensures that the benefits of equal contribution can be shared among all participating members. Second, the "revenue-neutral" principle holds that members are responsible for the costs incurred by their participation in all activities, and no money (e.g., tuitions, etc.) will change hands between any Alliance members. This promotes a not-for-profit culture, which will allow Alliance members to focus on collaborative win-win contributions. Finally, the "not-joint-degree" principle states that the Alliance's main goal is to share courseware development and collaborate on course delivery, rather than to create joint degrees among its member universities. This enables all Alliance members to maintain the independence and uniqueness of their curricula, which form the basis for their valuable contributions to the Alliance.

### 3.3 iPodia Technology
Different technologies, such as learning management systems, video-conferencing, web-conferencing, mobile messaging services, and social networking services, are employed

as means to realize the iPodia pedagogy. Note that, unlike the distance education in which technology functions to enlarge the delivery distance of content knowledge from teachers to students, iPodia which is a no-distance education paradigm relies on technologies to eliminate the physical distance between students in located in different campuses. Figure 4 presents a typical iPodia interactive classroom that is located in the USC campus. Table 1 summarizes various technologies used in a typical iPodia class.



Figure 4. Illustration of a typical iPodia interactive classroom

Table 1. Summary of technology enhanced learning in iPodia

| Pedagogy Hypothesis | Objectives ("End") | Technologies ("Means") |
|---|---|---|
| Interactive learning | Student-teacher | Video-conferencing and web-conferencing |
| | Student-content | Learning management system |
| | Student-student | Web-conferencing, mobile messaging, social networking |
| | Teacher-teacher | Web-conferencing |
| | Teacher-content | Learning management system |
| Inverted learning | Flip teaching | Learning management system |
| International learning | Class level | Video-conferencing |
| | Team Level | Web-conferencing |
| | Individual level | Mobile messaging and social networking |

## 3.4 iPodia and MOOC

The best innovation is a simple solution that addresses a critical problem to yield large impacts. iPodia is not the same as, but fully complementary to, the recent MOOC movement in the online education world. MOOC is a scale-up of the existing distance education model that puts subject contents online openly and freely for students to learn from the cyberspace. iPodia, in comparison, is a new no-distance education paradigm that provides borderless interactive learning opportunities for students to learn subject contexts with each other via the cyberspace. While different in their pedagogical foundations, MOOC and iPodia are complementary to each other in education practice as the flipped classroom (or called inverted learning in iPodia) approach becomes increasingly popular nowadays. With the flipped classroom approach, students can study the best online course contents offered by MOOC at home before coming to the iPodia

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interactive classroom on campus to collaboratively engage in interactive exercises to develop contextual understandings with classmates, as well as mutual understanding of each other, across physical, institutional and cultural boundaries. Together with MOOC, iPodia provides students with the best combination in the education world because they can both learn subject contents from the best global teachers and develop subject contexts with the best global peers.

**4. Conclusion**

The 21st century higher education is rapidly evolving towards a vastly different shape influenced by the global trends of mass industrialization of institutions, increase of education supply, underwater college degree, and student's changing demands towards campus education. Rather than competing with distance education in a read ocean, we believe that leading universities should shift their strategic focus to create a blue ocean of no-distance education. This paper introduces some of our efforts to substantiate the "no distance education" - iPodia. The iPodia pedagogy features with the "inverted", "interactive" and "international" learning. The iPodia alliance is an independent global consortium among leading universities, upon which various iPodia courses are collaboratively developed and jointly offered by multiple iPodia partners. To date, over 250 students from 6 different countries and regions of the world have taken different iPodia courses. Our future works include some rigorous researches that are conducted upon the iPodia platform. For example, the work in process projects include an formal assessment of student's learning effectiveness in iPodia classes, an investigation of iPodia impacts on student's preparedness working in global workforces, a study of student's behaviors working in multicultural virtual teams, a comparison of ideation effectiveness between monocultural collocated teams with multicultural virtual teams.

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