

An Executive Summary (ES)

ES.1

The central argument of this book is threefold: (1) while having top universities in the world is of great significance and pride, *mass access* to undergraduate college education is equally a great metric of the nation's strength and prosperity. Think of all Western/American colleges in a pyramid of quality and reputation. The professional strength of the nation depends on the learning quality in the whole pyramid rather than the top five percent.

(2) The transformative power of higher education and the riches it brings to ordinary people have made the nation and the world yearn for mass access to quality college education at an affordable cost. Data shows that the need for extended access to a college education is comparable to the growing need for high school education in the last century. Western college education, American in particular, is a most attractive product. Yet, the supply is limited, expensive, and a severe financial burden on students and their families. Unfortunately, this vast potential market is increasingly tapped by the burgeoning "diploma mills," where learning is often of low quality and usually optional, but empty or semi-empty diplomas are given regardless. It is an infection moving up the nation's education pyramid, wasting students' learning potentials and faculty's intellectual and the institution's financial and managerial resources in many otherwise respectable institutions.

(3) Other than updating "course and program design and content," the basic structure of classroom operations, inherited from the 1800s, has remained the same. The enshrined old and expensive process limits the quality of and access to college education. Only a paradigm shift from "*shop mode*" classroom operation to "*industrial scale orchestration of content production and delivery distributed locally*" can remove the bottlenecks of access and quality.

Imagining A Day in "*Joyful-Rigor Academy, JRA*"

ES.2

As an example of the proposed system, the imagined experiences of an entering freshman illustrate the book's philosophy:

Bruce Young is in his first year at *Pleasant High Campus*, one of the thousands of franchised local campuses affiliated with the *mega-university "Joyful-Rigor Academy (JRA)."* While affiliated campuses will vary from luxury to barebone, the *joyful-rigor* quality of the content and online delivery will be highly maintained by *JRA* Central. *JRA* is a major step toward making college education egalitarian

— providing a more equitable opportunity for a serious yet joyful education to students across the wide spectrum of economic conditions.

The JRA is among the dozens of competing mega-academies created based on a *Mass Customization of College Education (MCCE)* design.

MCCE Philosophy

ES.3

Mass access to every product has been the result of employing automation in a large industrial-scale orchestration in a centralized/decentralized structure. *Modularity* and *assembly* are at the core of any such orchestration, through which continuous improvements and cost reduction become possible. Most production systems function in a mass customization model, meaning that they offer the customer (a) many options and (b) provide service satisfying the individual's service need. In any such industry, the competition among companies forces them — and their large-scale mass production/customization enables them — to periodically improve on every part of each product. Thus, customers increasingly get better quality-cost combinations. The film and software industries work on the same principles, even though their products are of different genres, from manufacturing cars to appliances.

ES.4

MCCE looks at "learning" as yet another product genre. Learning is the abstract product of the education enterprise generated in students' minds but encapsulated in packages called "courses" composed of modules. *Programs* are then assembled of courses. Like other products, a course consists of *goods* and *services*. The "good" is the content. The "service" is providing an environment in which students are kept on target to absorb the content and grow intellectually. MCCE adopts *modularity* and *assembly* in its centralized/decentralized structure. Content and delivery are produced in a large-scale centralized human-technology orchestration but keep students on course in distributed/franchised affiliated campuses. The arrangement will offer continuous improvements in quality and costs — term after term.

ES.5

MCCE's design strategy is based on:

- (1) determining what parts of the learning process can lend itself to automation and what elements must remain under live instruction,

- (2) identifying the level of education suitable for the proposed system — namely undergraduate and high school, but not pre-high school, and not post-graduate research level,
- (3) defining how to transform an educational institution in successive transitional stages.

ES.6

The main feature of MCCE is producing content and delivery centrally through team orchestration — unlike the present system where the lone instructor performs these tasks with far less knowledge and resources and thus, on average, at far lower quality. MCCE content is then delivered face-to-face and remotely through distributed or franchised campuses in any neighborhood. The scale of MCCE and competition among such institutions will force them to improve the content and delivery of each course module and the combination of courses in each program every term.

ES.7

Under MCCE, using advanced technologies in a robust 21st-century hybrid institutional structure will produce significantly better cost-quality product space:

Lower costs achieved by

1. eliminating the colossal repeated production of, on average, mediocre content by every instructor across the system every term – the example in Introduction, I.14 will surprise you, and
2. reducing repeated overlaps between courses by modularizing the curriculum content.

The high quality achieved by

- (a) centralizing resources to produce high-quality modularized content in multiple learning styles/strategies,
- (b) maximizing the use of technology in the production, storage, and delivery of content,
- (c) efficient hybrid delivery of content to students, and
- (d) effective live instruction/training/mentoring/advising/support at the affiliated schools.

ES.8

While specializations aim to create a highly "productive" workforce to bring economic prosperity, JRA is committed to training students as whole-person citizens — highly productive but effective and ethical members of their collective:

family, organization, community, nation, and humanity. Therefore, in the JRA curriculum, every specialization is wrapped with *tailored* general, moral-ethical, and civic education.

ES.9

"Rigor" in education is the foundation of stimulating productive individual and collective lives. However, if rigorous education becomes boring, ordinary students will not successfully go through such an education.

ES.10

In MCCE, a joyful educational setting is defined as an environment where students experience:

1. growth,
2. meaning and purpose,
3. camaraderie, trust, and support.

MCCE achieves these objectives by:

- (i) creating a flexible curriculum where students can find the best match between their interests, abilities, field of study, and learning styles/strategies,
- (ii) adopting relevant strategies and tactics from the entertainment industries to create a joyful educational environment and,
- (iii) capitalizing on coached and *measured group learning and activities* to prevent the procrastination and dropouts that plague purely online education.

Single-handed teachers in the present system poorly afford these objectives.

ES.11

Like many young, Bruce is in the discovery phase of his life. His interests are still in flux, and his abilities are to be fully discovered.

In two ways, JRA promises to customize (personalize) his education to the best of his ability and interests.

1. As a *mega-academy*, JRA includes almost every known field of study, from trade certifications (e.g., plumbing, electrical work) to professional applied fields (e.g., nursing, engineering, medicine) to the highest levels of theory and philosophy. Bruce can change his program vertically from hands-on to professional to highly theoretical, and laterally to any other field of study. Under the advice of his parents and watchful school *advising apparatus*, which includes his campus instructors, Bruce knows that change will cost him time

and money. Nonetheless, he feels that paying for change is better than going reluctantly through an uninteresting field of study. The JRA system is designed to minimize such costs.

2. MCCE emphasizes *advisement* far more than the conventional system. The advisement system actively guides the student from admission to graduation. It starts with creating an extensive profile at the time of admission and expands it throughout the student's attendance under strict "privacy" regulations. The two pillars of advisement are (1) JRA Central Advisement Center and (2) instructors and advisors at local Affiliated Campuses.

JRA Central Advisement Center has an advanced *Performance Monitoring Artificial Intelligence* (PMAI) connected to the MCCE Computer Assisted Learning (MCCE-CAL) system, which holds the networked content and updating facilities. Each instructor has selected access to their students' profiles and the PMAI.

As a freshman in engineering, Bruce has enrolled in four courses, including Engineering Economy, Eng.106. Ms. Celeste Cicerone is the instructor for Eng.106 for this session. Course content and exams are developed and managed by JRA Central. Relieved from repeated content production, instructors like Ms. Cicerone focus their energy on keeping students *on course*. Beyond having a strong background in engineering project management, Celeste has gone through extensive JRA Teacher Certification (JRA-TC). The certification program is a serious training curriculum in theories and practices, learning styles, strategies, motivational psychology, team coaching, and mentoring. JRA invests heavily in state-of-the-art information technology such as Khanmigo, Khan Academy's artificial intelligence (AI)-powered guide. In JRA-TC, instructors undergo extensive training in team building and group learning in the spirit of team sports and decathlon academic competitions. The role of JRA instructors is crucial due to JRA's problem- and project-based approach to curriculum design, particularly in courses that are inherently "creative-based," such as sports, arts, and performance-based disciplines. Their expertise is key to fostering creativity and guiding students through hands-on, practical experiences integral to learning in these fields.

ES.12

As instruction and testing are decoupled in MCCE, Bruce develops a trusting relationship with Ms. Cicerone. This is in contrast to the present system, where the instructor's judging (grading) authority creates apprehension for the students and undermines trust. At the end of the term, Bruce will have a chance to evaluate the support he has received from Ms. Cicerone and his view on the quality of the

content received from JRA Central. But unlike the present system, there is no "reciprocal evaluation" in which students, through "student evaluation," judge the judge (the grading teacher) who will judge their performances. Thus, unlike the present system, Bruce has no way to bargain with Ms. Cicerone over the content, homework, or grading. All he expects from Ms. Cicerone is to place him in an effective group-learning team and help him do his best in the course.

ES.13

Group learning, hand in hand with problem-based learning, is a major strategy in MCCE. At the beginning of each term, Ms. Cicerone studies students' profiles, gauges students' learning styles/strategies, and creates group-learning teams. She may change group membership as new performance data emerge. As Bruce furthers his study, PMAI collects more data on Bruce's favorite learning styles/strategies and performances, thus offering better advice to guide Bruce's learning habits and recommending a more effective composition of group-learning teams. You have experienced similar AI applications in web searching and shopping online, which offer suggestions based on your prior activities.

ES.14

Feedback from instructors like Ms. Cicerone to JRA Central is a main source for continuing course updates.

ES.15

Like any other course, Eng.106 is composed of integrated modules. Today, Bruce and his team are working on a module called "Time Value of Money." Variations of this module are produced with different learning styles/strategies by faculty in other disciplines: branches of economics, finance, accounting, project management, decision support systems, etc. Modules are produced mostly at JRA Central but are also acquired from third parties, such as Khan Academy or Coursera. Each variation can have its own flavor, practice sets, and learning styles/strategies.

ES.16

In MCCE design, "*whole-person education*" means achieving an *integrated network* of knowledge and skills instead of covering a set of separate islands of information, knowledge, and skills. MCCE is also an integration of "Range"¹ and specialization². Two MCCE strategies are pivotal in creating an integrated network – *tailoring* and *infusion*. Tailoring is wrapping every specialization with

¹ David Epstein's "Range: Why Generalists Triumph in a Specialized World."

² Malcolm Gladwell's 10,000-hour rule, "Outliers."

tailored general, ethics, and civics education. *Infusion* is where each faculty member will try to infuse relevant pieces of their knowledge into other fields.

ES.17

Beyond the table of contents and this summary, three broad perspectives on MCCE are offered: The Introduction, table 2 at the end of chapter 5, and chapter 11, which recaps MCCE contributions.