

COMPETENCY-BASED UNDERGRADUATE ADVANCED EDUCATION MODELS IN KOREA

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Received March 2018; accepted June 2018

ABSTRACT. *The Ministry of Education in Korea has invested a lot of budget into competency-based education projects to improve the quality of university education for preparing future trends. This research tries to enhance the understanding of mainstream undergraduate education model in Korea, so contribute to making some building blocks for designing better education model. To accomplish the goal, we reviewed ACE+ (Advancement of College Education) project plans of large universities in capital region and small universities in noncapital region and deduced commonness and differences. The outcomes will be helpful for the designing education model for training future talented person.*

Keywords: Core competency, Education model, ACE+ project, Education engineering

1. **Introduction.** Dynamic environment change including the 4th industry revolution [1] has requested preparing effective action for future trends, which required higher education organization to train future talented person. To meet the demands, Korea government has driven competency (job skills related to output and gained by education and training) based systematic education systems into undergraduate universities. The first reason why it is driven by government rather than university itself is that research-oriented efforts have been done (6 times budget of education project into research projects). The second is quantity growth rather than quality growth. The population of higher education is number two, whereas education competitiveness is 55 ranking in 2016. The third is mismatch ratio between major and job, which is 49.8% in 2015 [2].

Ministry of Education in Korea has invested a lot of budget into education project to improve the quality of university education for almost ten years. In the beginning, the project title is education competency strengthening project and ACE project since 2010 and ACE+ in 2017 [3,4]. The focus of the project is to establish competency-based systematic education systems in undergraduate universities. Such educational projects have positive aspects considering the problems of the ministry's university evaluation system, which has been the main focus of most universities in Korea [5,6].

This research tries to analyze undergraduate education in Korea using ACE+ project plans, deduce several implications and contribute to making some building blocks for designing better education model in Korea. Author tried to analyze the main stream of undergraduate education using ACE+ project and compare it with IT related KCC2015 engineering authentication criteria in previous research [7]. Unlike [7], this paper used generally accepted education framework (Objective-Process-Outcome) and reviewed ACE+ real project plan of large universities in capital region and small universities in noncapital region. This paper is organized as follows. Section 2 presents characteristics and implications of educational objectives, curriculums and output in each subsection consequently and Section 3 draws conclusions.

2. Characteristics and Implications.

2.1. Educational objectives. Educational objectives are related to long-term plan (Mission or Vision, Core strategies, Educational project objective), concept of talent and core competences required for the talented person. Among them, Mission (Vision) and core strategies are not so different. So, we omit it due to page limit and describe educational project objective, concept of talented person and core competencies. Firstly, representative characteristics of large universities in capital region and small universities in noncapital region are shown in Table 1. We can find that many universities made their own acronym showing their focus and specialization. Common keywords are convergence, human personality, global and creativity. Unlike large universities, small colleges focus on more specific objective considering their location and main discipline.

TABLE 1. Characteristics of educational project objectives

Groups	Main Keywords
Large universities (capital region)	BIG + FREE (Balanced liberal education, Innovative convergence education, Global service learning oriented extracurricular education + FREE)
	MAX (HuMan value, Action value, X: Crossing value) educational systems
	Training THE (Telos, Hokma, Experience) person leading future society
Small universities (noncapital region)	RC (Residential College) system innovation-based education model
	SOL (Student Experience Oriented Learning Concert)-based BRIDGE type education for glocal SMART talented person
	S-FM (Self-directed First Mover) education for training Dadam type person

Table 2 shows the representative characteristics of concept of talented person and core competencies. We can find that most competencies are similar to six skills assessed by K-CESA (Korea College Essential Skills Assessment), which are communication, global, personal relationship, syntactic thinking, utilization of resource-information-technology and self-management [8].

TABLE 2. Characteristics of concept of talented and core competencies

Groups	Main Keywords
Large universities (capital region)	*Concept of talented: humanity, creative challenger, community virtue *Core competencies: self-directed, communication, creative thinking, knowledge, cooperation, global
	*Concept of talented: creative intellectual, cultured, global challenger *Core competencies: creativity, convergence, community, communication, leadership, global
	*Concept of talented: humanity, intellectual, competencies, creativity *Core competencies: cooperative service, challenger, communication, information processing, problem solving, global citizenship
Small universities (noncapital region)	*Concept of talented: servant leadership, creativity, collaboration *Core competencies: empathy, thinking, flow
	*Concept of talented: emotional, creative, global, practical, convergent *Core competencies: moral & ethic, creative & logical thinking, analytic skill, problem solving, social relationship, communication skill, global
	*Concept of talented: Dadam type (Jeong Yak-yong and Hong Dae-yong) *Core competencies: problem solving (creative and convergent), study leadership (challenge), major competency (field), humanity (me, you and us)

TABLE 3. Characteristics of liberal arts curriculum

Groups	Main Keywords
Large universities (capital region)	*Phronesis humanity: comprehensive personality (reading seminar, reading classical literature), freshman seminar (ethical education, self-project) *Anabasis intellectual: supremacy (writing and discussion, English, coding), crossover education for fostering creative and convergence thinking *Katabasis practice: problem solving bridge (service for community), global citizenship (special lecture, global self-research) *Liberal arts specialization: C.A.P (Career Active Planning) for low year, 1 year job path seminar, natural history museum, cultural museum *Globalization: Get It Global (sharing experiences), Get Global (exploring historical remains of east Asia), Second language camp *Authentication: H-reading authentication, H-sharing authentication *Competencies: liberal arts-major bridge program, convergence subjects, Korea ISC (Intensive Study Course) for foreign *Humanity: subjects (analects, classical literature, leadership), measuring humanism (sincerity, care, justice, responsibility), graduation requirement *Global BSM: English BSM, self-experiment, math learning program *Korea FYE (First Year Experience) model: early bird, peer learning
Small universities (noncapital region)	*Humanity: college history, joint RC program involving international student, life and sharing connected with region, global poverty program *Fundamental competencies: integration of reading, writing and discussion, practical science subject customized to major, intensive training in vacation *Customized convergence: integrated subject of major and liberal arts, design-based creative expression, human science, lab type experiment *7-Core curriculum: Sol humanity, balanced and convergent subject, local friendly liberal arts *True liberal arts: aligning general education with major, liberal arts circle, liberal arts learning concert week, Sol challenge (global, local community) *Basic knowledge: credits expansion, See-Do-Learn module, triangle type module, communication, peer tutoring *STEAM education: MSC module, Web-based evaluation tool, mathematics *Humanity: education considering grade, intensive 4 weeks program, experience-based humanity program

2.2. **Education courses.** Education courses are divided into liberal arts curriculum, major curriculum and extracurricular course. Representative characteristics of each curriculum are shown in Tables 3-5 according to the course type.

In Table 3, we can find that common keywords are humanism, reading, writing, global language, multidisciplinary subject and self-directed programs. First year program, BSM, culture, job career community service and intensive course are different across universities. Unlike large universities, small colleges put more emphasis on basic subject (mathematics, science) and aligning liberal arts education with major discipline.

In Table 4, we can find that most universities emphasize on major breaking, interdisciplinary major, convergent major, self-designed major, cooperation with industry, multi-track according to career and globalization. Unlike large universities, small colleges pursue intensive program, cooperation with other local colleges and flexible semester allowing IPP (Industry Professional Practice).

In Table 5, we can find that most universities pursue their unique and specialized extracurricular programs, for example, Glocal, NGO, Honors club, super leadership, e-QUEST, great book da Vinci, RC and NSLB program.

TABLE 4. Characteristics of major curriculum

Groups	Main Keywords
Large universities (capital region)	*W program: code sharing (18 credits in other major) program *I program: global major (Hawaii campus, silicon valley internship) *N program: convergence project subject, capstone design expansion *D program: authenticated honors program (intensive, convergence, career) *T (Truth) track: academic researchers *E (Education-Industry Cooperation) track: field based experts (internship) *L (global Leader) track: English major subjects, global semester *O (Open and convergent) track: creative and convergent skills *S (Self-design) track: self-directed innovative talented person *Breaking major barrier: self-designed transdisciplinary studies major, omnibus convergent lecture based on humanism and society, cross-listing *Global Supreme Studies: global leading university study, global strategic country (1 semester) study, ISS (International Summer Semester) *Venture friendly industry-education: Co-op program (domestic and foreign internship credits), capstone design based joint project, joint education *First Penguin Project: UROP (Undergraduate Research Opportunities Program), student-professor joint researches, undergraduate-graduate subjects
Small universities (noncapital region)	*SODO (Small Office Dormitory Office) project: major immersion education in dormitory, RC capstone design, undergraduate research subject *Creative Reed Program: 'taking other major discipline' program, shared major, open major module for other major students, field experts lecturing *Creative convergence: learning concert using 4 semester system, cross-over between departments, aligning major with extracurricular course *Glocal connection: communication among local colleges, global credits certification, global capstone design *Social demand connection: career-based industry friendly curriculum, grade-based curriculum, Intra College Academy *Self-directed study: self-designed module, student-directed teaching subject *4th industry revolution: infra technology/application technology/new technology, shared module, smart factory *Field problem solving: hands-on based practice, multidisciplinary, school-work link, intensive semester for graduation design, IPP

2.3. Education outcomes. Education outcomes can be measured by both core output index and self-output index. The number of core output indexes is three and most self-output index has seven. Among the 7 self-output indexes, we reviewed 3 indexes related to liberal art curriculum, major curriculum and extracurricular course. Representative characteristics of each university's output indexes are shown in Tables 6 and 7.

In Table 6, we can find that most universities use core competency measurement, satisfaction score and spreading efforts. Core competency measuring is done by university own tool or K-CESA result. Some universities utilize their unique and specialized measurements, which are humanity, self-study, action of lower evaluation score professors and graduation reputation. Unlike large universities, small colleges consider more detail indexes containing their own many specific factors.

In Table 7, we can find that most universities use satisfaction survey, lecture evaluation score, the number of program participants and the ratio of interdisciplinary track participating departments and students. Some universities focus on their unique and specialized

TABLE 5. Characteristics of extracurricular course

Groups	Main Keywords
Large universities (capital region)	*Action Human Love: sharing and service (education, mission, talent), reading donation, exchange student, neglected class (multi-cultural, poor)
	*Action Dream: personalized career program, connection with community
	*Action Together: global project (peace, human right, environment), NGO
	*Demand based e-QUEST track: expert track, military track and so on
	*E ³ domain: E1 (career, expert), E2 (service, network: healing, mentoring, career fair), E3 (global citizenship: oversea service, EGGP, mate)
	*E DNA network: career design exhibition for freshman, creative career fair for industry cooperation, community network program
	*Humanity fostering: humanity center, camp, essay, act program
	*Creative school: creative school (find, think, solve)
	*Leadership program: wash me and govern people program
*Reading education program: five cart reading program, reading based convergent lecture, Great Books Reading Academy	
Small universities (noncapital region)	*RC program innovation: autonomous community activity, RC common humanity, integrated management system
	*Multifaceted communication: cultural arts, basic communication project, information usage and media production program, multi-cultural family
	*Regional based career development: supporting low income bracket, regional internship program, regional based venture program
	*Humanity and challenge: Sol-Challenge (undergraduate global research project), Sol-Silkroad (sharing education resources with local citizen)
	*Empowering every student: Sol-NSLB (No Student Left Behind Program) through professor's detail guidance, Sol-Great Books
	*Studying leadership: study and life mentoring, student-directed Wikipedia platform for learning material, circle, study group, research
	*Exploration: reading, discussion, speech, writing, digital literacy, student-directed group exploring future technologies
*Me-and-Us humanity: all grade participation program, domestic and over-sea social service program	

TABLE 6. Characteristics of core output indexes

Groups	Main Keywords
Large universities (capital region)	*Core competency: relationship, global, self-management of K-CESA
	*Education satisfaction: overall satisfaction
	*Self-development: student engagement, intellectual activity, active-cooperative study competencies in K-NSSE (Korea National Survey of Student Engagement)
	*Humanity: Analects register extracurricular humanity program participation, service time
	*Core competency: university tool (SCCA)
	*Model spreading: sharing and spreading (seminar, symposium, consulting and etc.), smart learning (KOCW, SOCW, S-MOOC K-MOOC MOOC)
	*Core competency: communication, comprehensive thinking, global competency in K-CESA → university tool
*Graduate reputation: Top 200 company and 400 CEO survey (willing to recommend, well major and liberal arts curriculum, potential)	
*Lecture evaluation score: major evaluation score + liberal arts score	

continued

Small universities (noncapital region)	*RC innovation: lecture reorganization, autonomous community participant, overall satisfaction *Core competency: K-CESA + university tool *Authentication of talented person: the number of student gaining 200 points or more in extracurricular course program
	*Global: global program participants, oversea exchange course participant *Sol: student experience survey (knowledge, growth, environment) *Bridge: humanity (social service), global ICT (global program participants), major (learning concert program), career activity (career consulting program participants, career-oriented lecture participants)
	*Dadam competency: university tool *Educational satisfaction: overall satisfaction, lecture evaluation score, student program *Student engagement: mentoring/peer counseling/H&C (Human & Career) program participants and satisfaction

TABLE 7. Characteristics of self-output indexes

Groups	Main Keywords
Large universities (capital region)	*Liberal arts education: satisfaction competency *Major education: satisfaction students ratio of multi-major engagement *Extracurricular education: satisfaction representative program participation
	*Liberal arts education: satisfaction specialization subject *Major education: track output creative convergent subject satisfaction *Extracurricular education: satisfaction program participants *First year education (liberal arts education): pre study and active attitude *Global major: foreign language lecture global program participants English evaluation score *Reading education (extracurricular education): reading five cart books program participants the number of reading notes lecture related reader
Small universities (noncapital region)	*Liberal arts innovation: new lecture opening, innovation ratio, satisfaction *Major innovation: SODO project participants, open module participating departments, field expert lecturing subjects *Extracurricular activities: program participants, satisfaction, new program
	*Sol Sup: Sol Sup program (1 year learning motivation) satisfaction *Major competency: convergent subject participants, subject satisfaction *Extracurricular competency: program participants, program satisfaction *Liberal arts innovation: participants and satisfaction of STEAM, Do-and-See, humanity, Triangular type subjects *Future innovation (major): K-Maker program participants/satisfaction, capstone lecture evaluation score, major competency *Extracurricular performing: program participants, satisfaction, output

measurements, which are student participation with professor, official authentication, employment ratio and reading power.

3. Conclusions. In this paper, we presented several review results. In educational objects area, we can find that some universities tried to make their own project acronym showing their focus and specialization. Also, most competencies for students are similar to six skills assessed by K-CESA. In education courses, we can find that most universities

emphasize on major breaking, interdisciplinary major, convergent major, self-designed major, cooperation with industry, multi-track according to career and globalization. In education outcomes area, we can find that most universities use satisfaction survey, lecture evaluation score, the number of program participants and the ratio of interdisciplinary track participating departments and students.

Unlike large universities, small colleges have more specific objective considering their geographical location and specialized discipline. So, they put more emphasis on basic subject (mathematics, science), aligning liberal arts education with major discipline, intensive program, cooperation with regional community and flexible semester allowing IPP. Government-driven education innovation may be efficient and fast methodology to achieve goals, however may cause systematic buy mechanical education system and push a lot of overhead (resource, time and cost) into universities. Therefore, there is a need to find tradeoffs between effectiveness and efficiency considering the characteristics of university consisting of students in twenties and scholars.

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