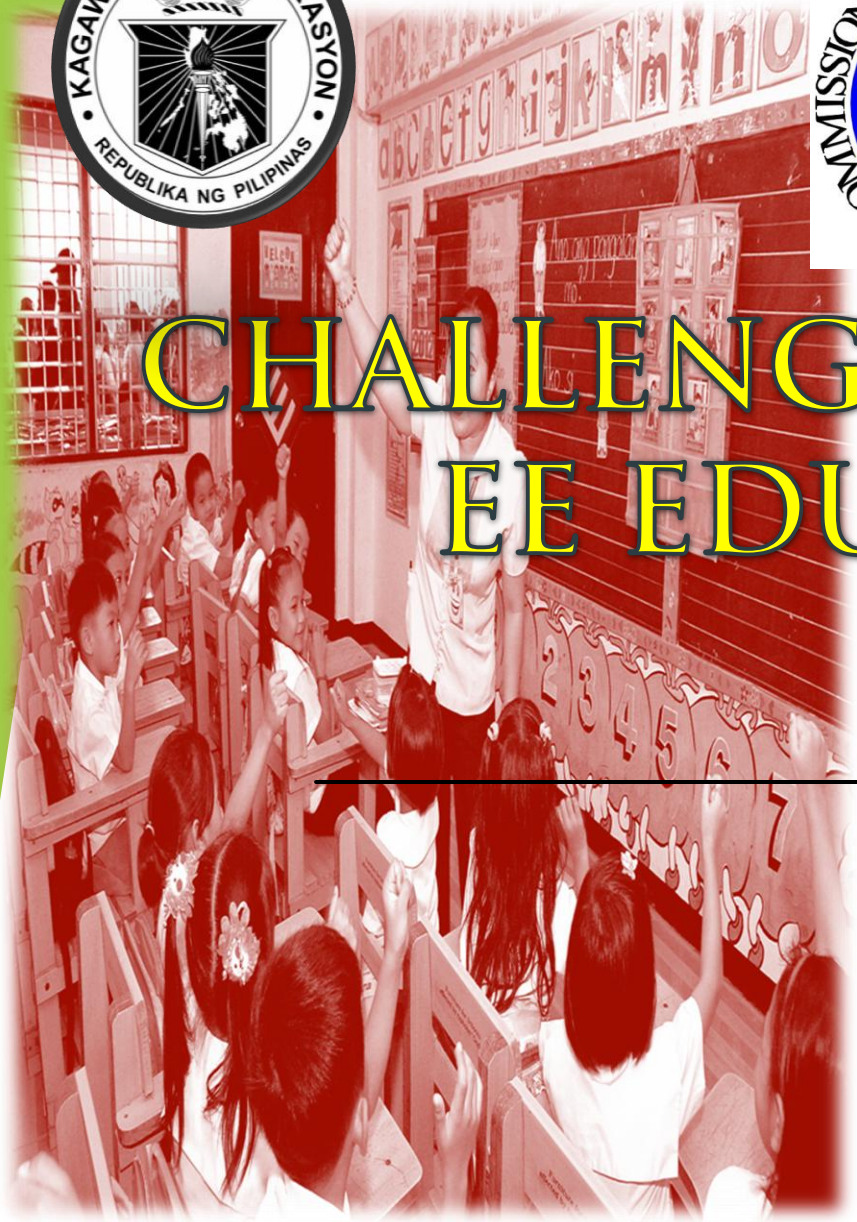


CHALLENGES OF K12 TO EE EDUCATION

RAUL C. ALVAREZ, JR. REE, Ed.D, CESO III
Director IV
CHEDRO XI

K-12: A History of Postponements

- Concerns on the scope and length of basic education raised as early as the Monroe Survey of 1925, the Prosser Survey (1930) and the 1949 UNESCO Mission Survey (introduced Grade 7)

- *Prior to the 1940's, seven-four model (7 years elementary, 4* years secondary) or 11 years of basic *education;*

K-12: A History of Postponements

- Under the Commonwealth Government, the American system prescribed a shift to a six-three-three model (6 years elementary, 3 years junior high school, and 3 years senior high school);
- *Grade 7 was promptly removed but the high school expansion was never realized;*

- ***Reduction of schooling years from 11 years before World War II, to only 10 years after the Commonwealth, WAS UNINTENDED:***

K-12: A History of Postponements

- Sectoral reviews on public education from the 1949 UNESCO Mission Survey, the 1960 Swanson Survey and the 1970 Presidential Commission to Survey Philippine Education (1970), were unanimous in recommending a revert to previous practice but *lengthening the school year was shadowed by doubts that the state can finance it*
- EDCOM (1991) retained 10 years to minimize the burden of government funding

K-12: A History of Postponements

- 1998 Philippine Education Sector Study (PESS)—compulsory pre-school and Grade 7 but Asian financial crisis prevented pursuit of the policy
- *2001 Philippine Commission for Education Reform (PCER)—compulsory one-year pre-baccalaureate*
- 2004 DepEd Bridging Program in Math, science, English but strong political pressure of 2004 elections resulted to only an optional bridging program
- 2013 Enhanced Basic Education Act (RA 10533)

Senior High School (SHS) Curriculum and Program Requirements

The K to 12 Philippine Basic Education Curriculum Framework

Holistically Developed Filipino with 21st Century Skills

Being and Becoming a Whole Person

SKILLS

Information, Media, and Technology Skills
Learning and Innovation Skills
Communication Skills
Life and Career Skills

LEARNING AREAS

Language
Technology and Livelihood Education (TLE)
Mathematics and Science
Arts and Humanities

Curriculum Support System

Teachers

Materials, Facilities, and Equipment

ICT Environment

Assessment

School Leadership and Management

Schools Divisions Technical Assistance

Community-Industry Relevance and Partnerships

Monitoring and Evaluation System

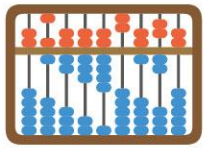
Senior High School Curriculum

SHS CORE CURRICULUM: THE EIGHT (8) LEARNING AREAS

LANGUAGE

HUMANITIES

COMMUNICATION



MATHEMATICS

PHILOSOPHY

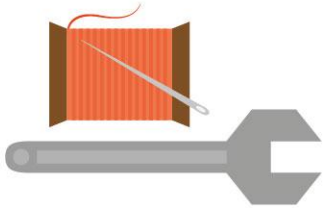
SCIENCE

SOCIAL SCIENCE

P.E. & HEALTH

SHS TRACKS

ACADEMIC*



TECHNICAL-VOCATIONAL-LIVELIHOOD

SPORTS

ARTS & DESIGN

**The Academic track includes four (4) strands: Accountancy, Business and Management (ABM); General Academic; Humanities and Social Science (HUMSS); and Science, Technology, Engineering and Mathematics (STEM).*

Grades 11 and 12 will have 31
80-hour subjects, totalling 2,480 hours.

31 TOTAL SUBJECTS

15

Core *Subjects*

16

Track *Subjects*

7

Applied Track Subjects

9

Specialized subjects

Each subject will have 80 hours per semester
P.E. and Health will have 20 hours per semester for 4 semesters

Senior High School Core Subjects

Core Learning Areas and Subjects		hours per semester
Language	Oral Communication	80
	Reading & Writing	80
	Komunikasyon at Pananaliksik sa Wika at Kulturang Pilipino	80
	Pagbasa at Pagsusuri ng Iba't Ibang Teksto Tungo sa Pananaliksik	80
Humanities	21st Century Literature from the Philippines and the World	80
	Contemporary Philippine Arts from the Regions	80
Communication	Media & Information Literacy	80
Mathematics	General Mathematics	80
	Statistics & Probability	80
Science	Earth and Life Science (Lecture and Laboratory)	80
	Physical Science (Lecture and Laboratory)	80
Social Science	Personal Development / *Pansariling Kaunlaran*	80
	Understanding Culture, Society and Politics	80
Philosophy	Introduction to the Philosophy of the Human Person / *Pambungad sa Pilosopiya ng Tao*	80
PE and Health	Physical Education and Health	80
CORE Total Number of Hours		**1,200**
TRACK Total Number of Hours		**1,280**
Total Number of Hours (CORE + TRACK)		**2,480**
Total Hours (CORE + TRACK) divided by Number of School Days in SHS (400) = average hours/day		**6.2**

Applied Track Subjects

Academic, Technical-Vocational-Livelihood, Sports, Arts & Design Tracks	
1	English for Academic and Professional Purposes
2	Practical Research 1
3	Practical Research 2
4	*Filipino sa Piling Larangan (Akademik, Isports, Sining at Tech-Voc)*
5	Empowerment Technologies (for the Strand)
6	Entrepreneurship
7	Inquiries, Investigations and Immersion

Each subject will have 80 hours per semester

Academic Track
Specialized Subjects

Science, Technology, Engineering and Mathematics Strand		
8	STEM Strand 1	Pre-Calculus
9	STEM Strand 2	Basic Calculus
10	STEM Strand 3	General Biology 1
11	STEM Strand 4	General Biology 2
12	STEM Strand 5	General Physics 1
13	STEM Strand 6	General Physics 2
14	STEM Strand 7	General Chemistry 1
15	STEM Strand 8	General Chemistry 2
16	STEM Strand 9	Work Immersion/Research/Career Advocacy/Culminating Activity

Each subject will have 80 hours per semester

Academic Track –STEM Strand
Facilities, Materials and Equipment Requirements

Essential program will not run/not be implemented without these		Supplemental will enhance/enrich implementation	
Facilities	Materials, Equipment		
1 Life Science Laboratory (including sink, storage,shower) 1 Chemistry laboratory (including sink, storage,shower) *1 Physical Science* Laboratory (including sink, storage,shower) 1 Computer laboratory	1. Basic Science equipment Stand base assembly Stand support Ring with stem Multiclamp assembly Universal bosshead assembly 2. Mechanics Science equipment Cart-rail system Free fall apparatus Hooke's law apparatus		

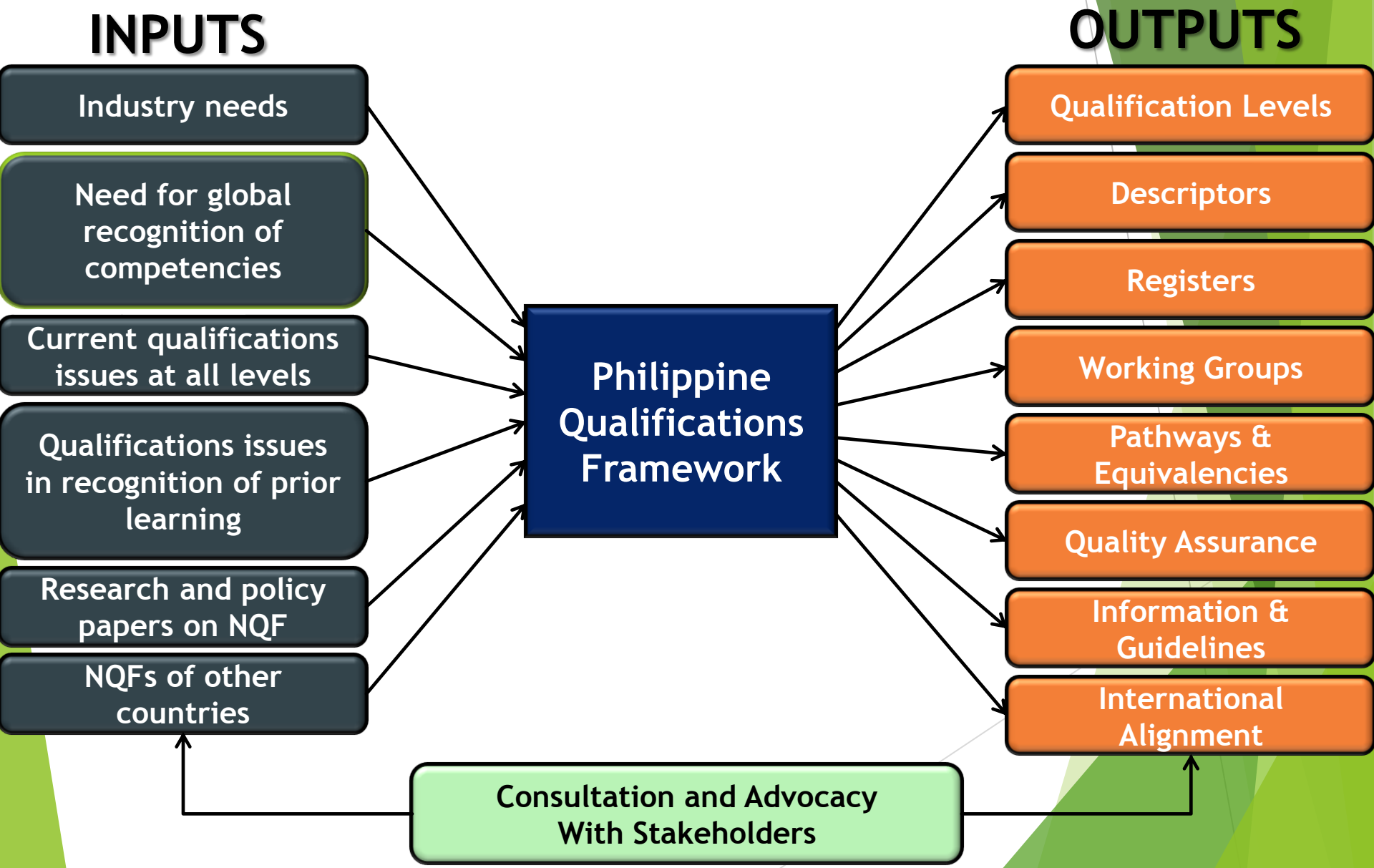
Academic Track – STEM Strand
Draft Assessment Requirements

Entry Assessment	Classroom-Based Assessment	Exit Assessment
1. Admission test 2. Career Assessment	1. Science/ Technology/ Math Literacy skills 2. Research skills 3. Experimental skills	Math/Science/ Technology / research/ investigation with abstracts that are accessible in the world wide web

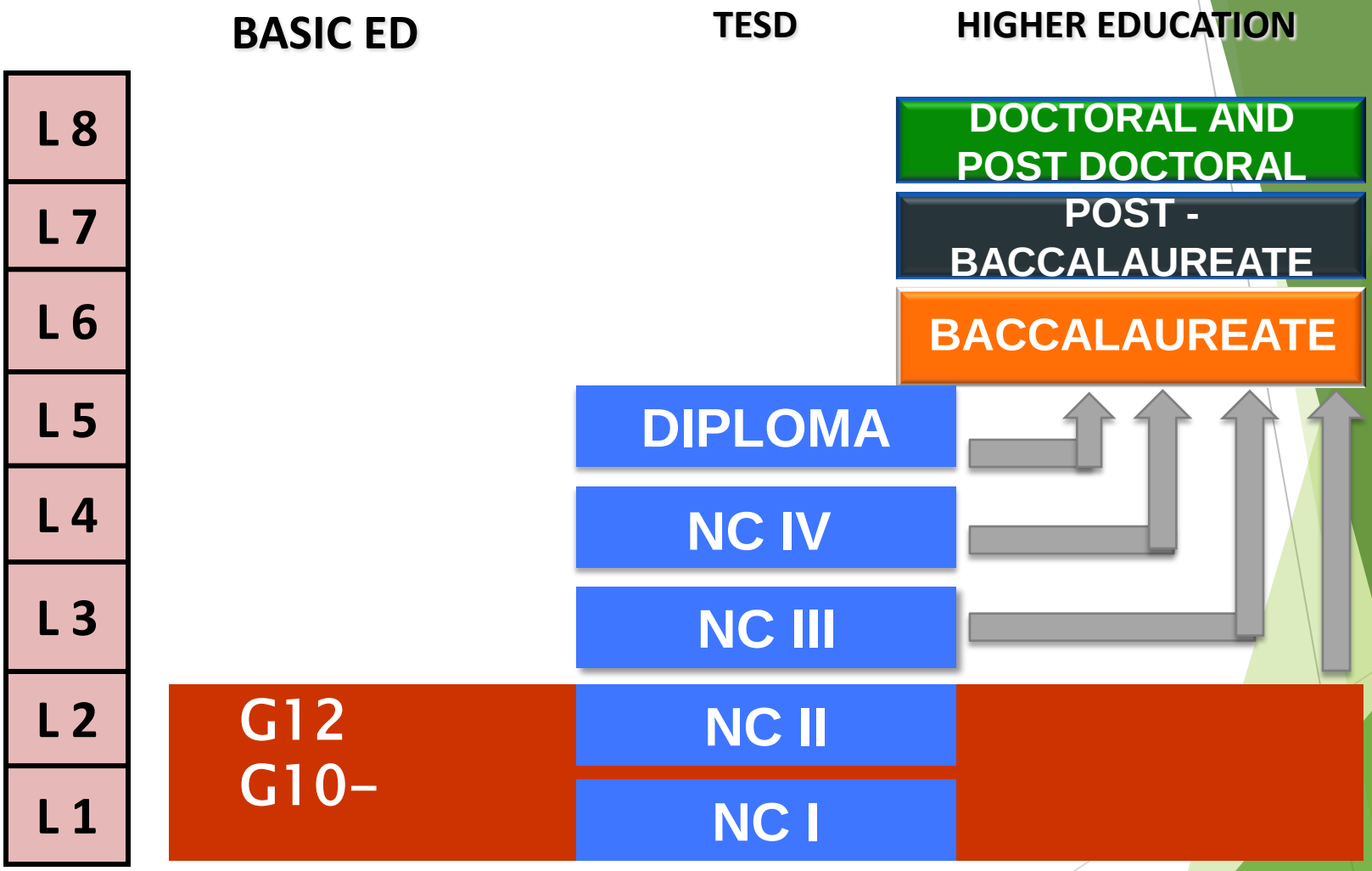
IMPACT OF K-12 ON HIGHER EDUCATION

The Philippine Education System

The PQF:


INPUTS
Industry needs
Need for global recognition of competencies
Current qualifications issues at all levels
Qualifications issues in recognition of prior learning
Research and policy papers on NQF
NQFs of other countries
Philippine Qualifications Framework
OUTPUTS
Qualification Levels
Descriptors
Registers
Working Groups
Pathways & Equivalencies
Quality Assurance
Information & Guidelines
International Alignment
Consultation and Advocacy With Stakeholders

THE PHL QUALIFICATIONS FRAMEWORK



LEVEL 6	Descriptors
KNOWLEDGE, SKILLS AND VALUES	Graduates at this level can demonstrate broad and coherent knowledge and skills in their respective fields of study for professional/creative work , innovations, and lifelong learning
APPLICATION	Application in professional/creative work research and innovation in a specialized field of discipline and/or further study
DEGREE OF INDEPENDENCE	Some (Substantial) degree of independence and/or in teams of related fields with minimal supervision
QUALIFICATION TYPE	Baccalaureate Degree

What were the CHALLENGES?

- Review and revision of the Policies, Standards and Guidelines (PSGs) to transform the current PSGs into an outcomes-based format;
- The Technical Panels/Committees for each discipline will prescribe the competencies required for each program;
- Review and revision of the Training Regulations to realign them with the new descriptors in technical skills development

- Harmonization of the pertinent K-12 curriculum with the new descriptors;
- Alignment of licensure examinations
- Continuing consultations with industry; and
- Advocacy and public hearings to be conducted at the regional levels

K12 IMPACT: Curricular and Program Changes

*Current **General Education Curriculum***

- 63 units of courses from various disciplines for students majoring in non-science (including mathematics and science-related) programs,
- 51 units for mathematics-, science- and science-related majors.
- ***Remedial Courses have been moved to Senior High School***

GE in 2018

- 24 units of core courses;9 units of elective courses; and
- 3 units on the life and works of Rizal (as mandated by law).

Curriculum and Academic Programs

- College Readiness Standards: already developed by the CHED GE Task Force
- CHED Technical panels involved in the development of Senior High School courses;
- Possibly shortened curriculum:

  Revision of Policies, Standards and Guidelines

  --PSGs for 2015-2017 [shift to learning competency-based standards CMO 46 s 2012]

  --PSGs for 2018 onwards

  --PSGs for ladderized and associate programs

OBE and EE Education

IMPERATIVES FOR REFORM

PROGRAM IMPERATIVES

LOCAL IMPERATIVES

REGIONAL IMPERATIVES

GLOBAL IMPERATIVES

It is **IMPERATIVE** for ENGINEERING PROGRAMS to become cognizant of the confluence of current needs and demands that shape the nature and impact of our discipline (BSEE)

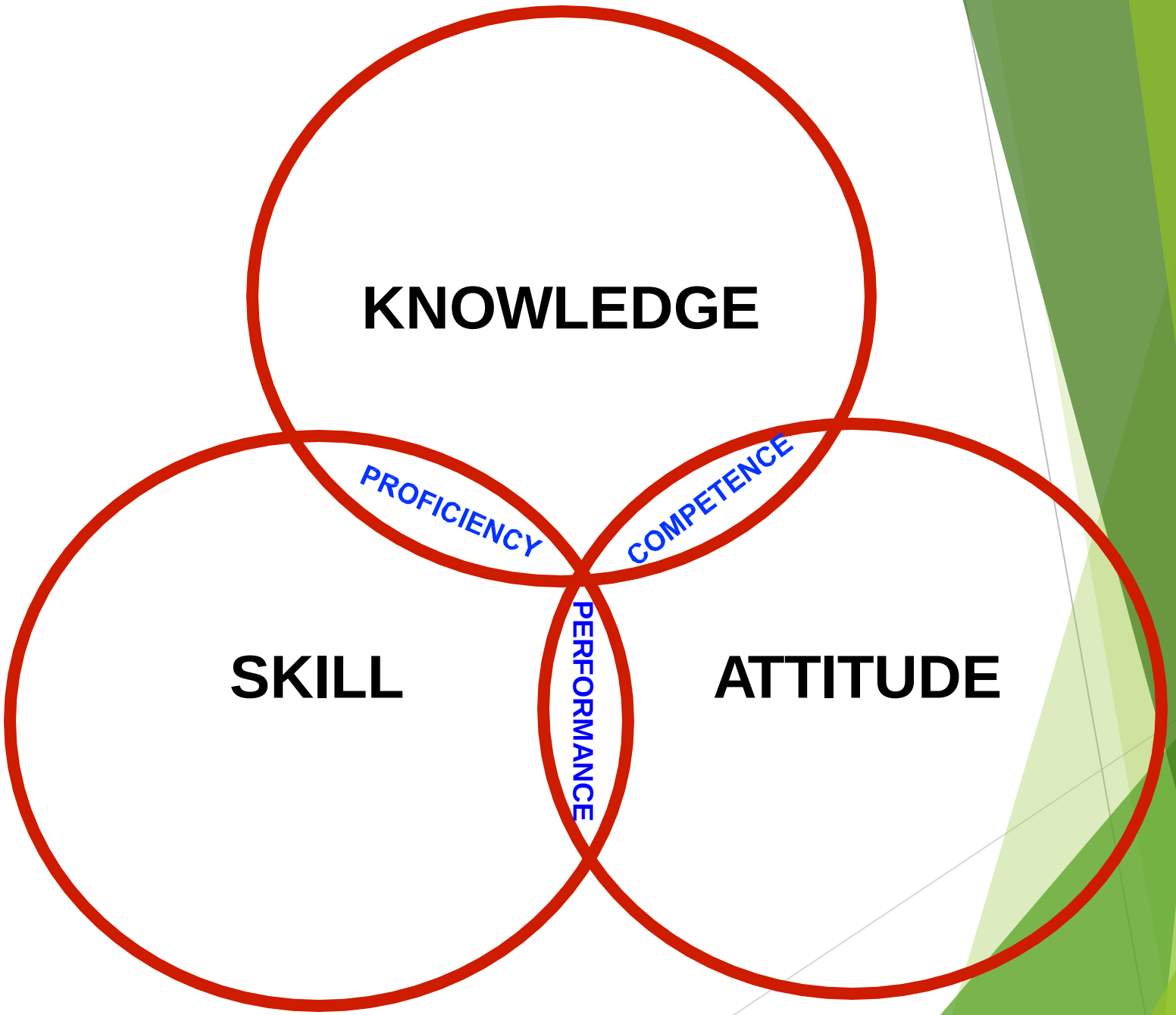
THE 'LOGIC' OF OBE

"Say what you want students to be able to do, teach them to do it and then see if they can, in fact, do it."

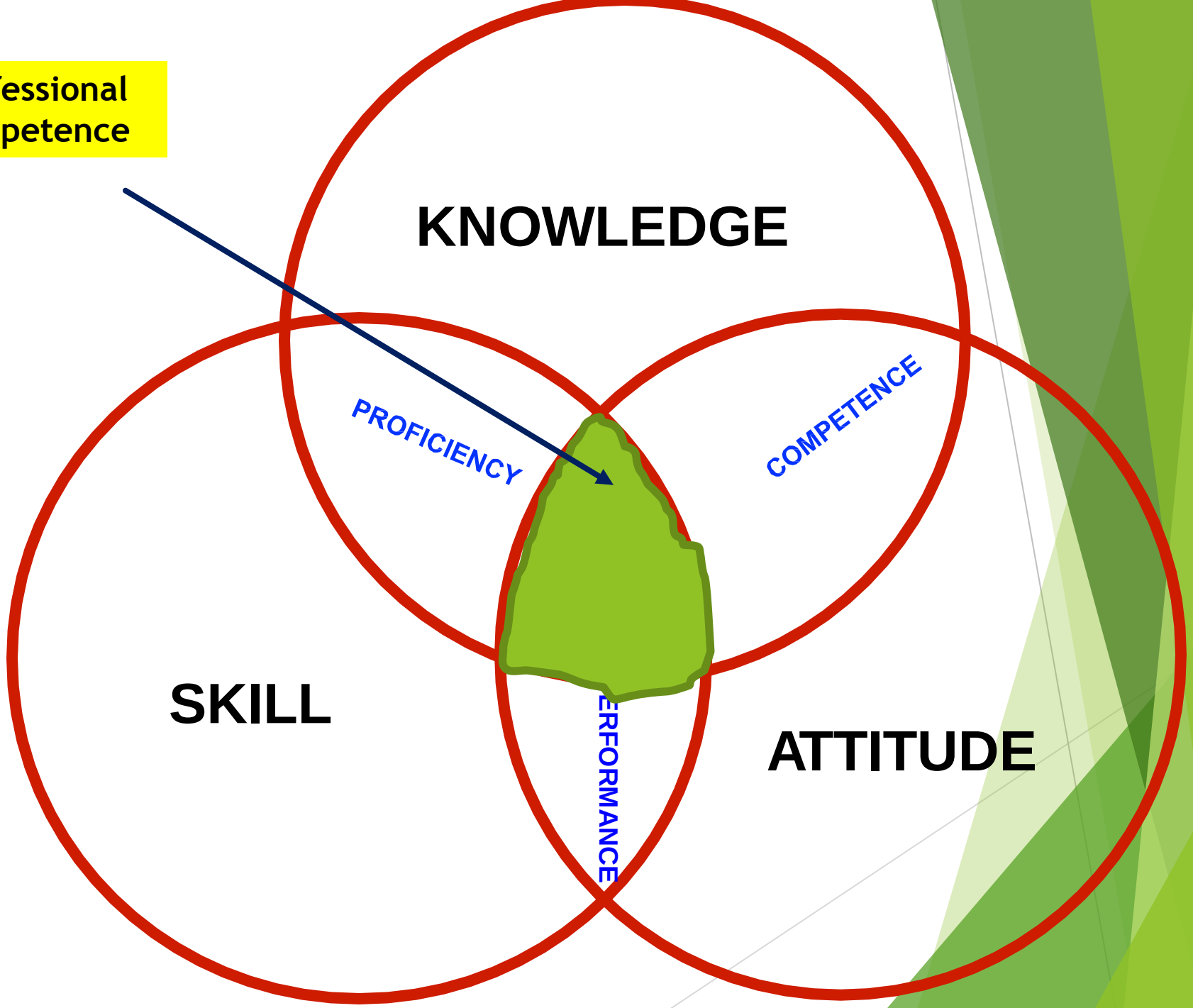
[J. Biggs & C. Tang, *Teaching for Quality Learning at University,* 3rd Ed, p.177. Open University, 2007.]

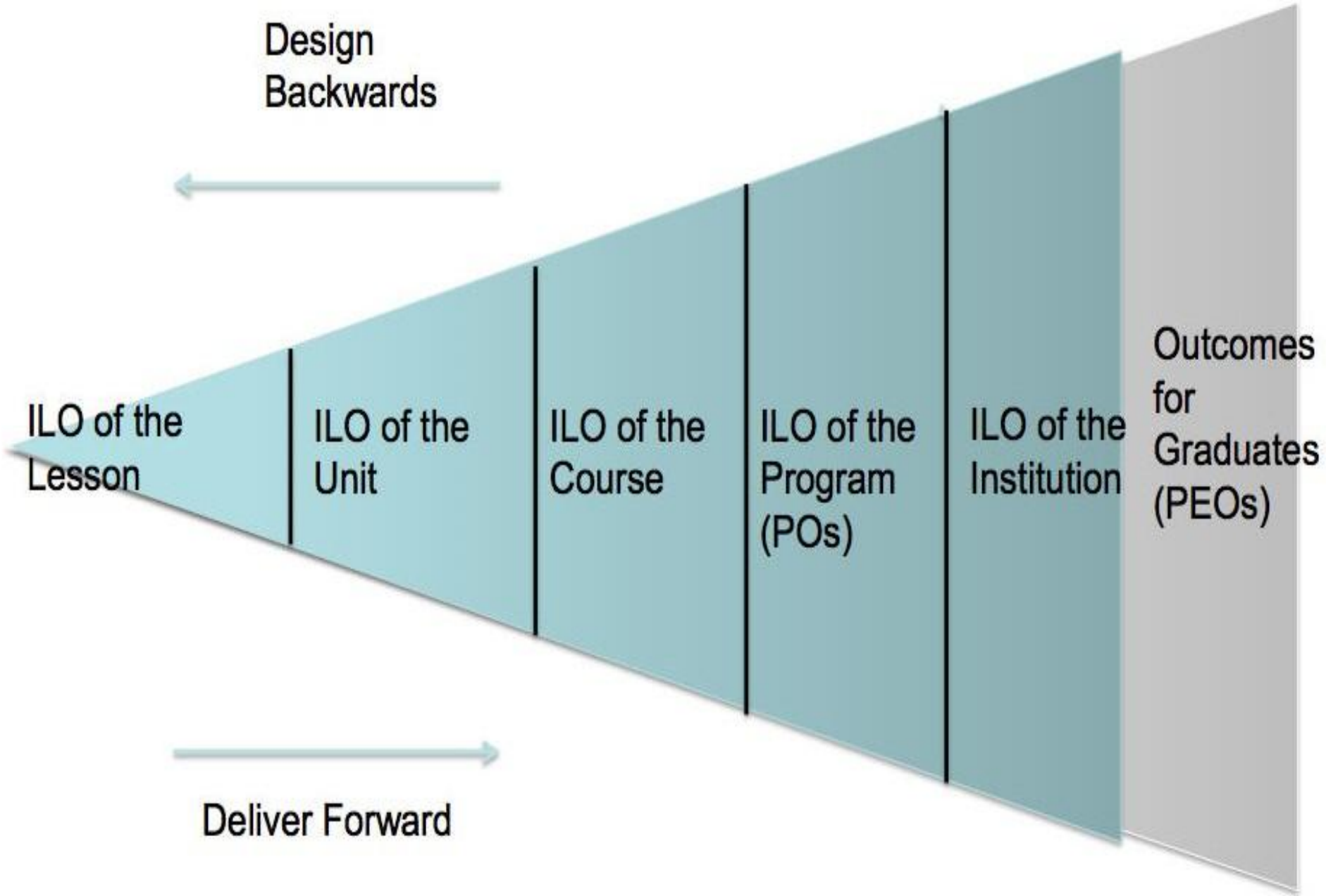
+ THE LANGUAGE OF OBE

- **Knowledge** – information that one has stored through experience
- **Skills** – demonstrable abilities (abilities are potential)
- **Attitudes** – evaluative cognitions regarding things/ activities (+ or – judgment)
  - Together, a cluster of related KSAs make up a ***competency***.


KNOWLEDGE
PROFICIENCY
COMPETENCE
SKILL
PERFORMANCE
ATTITUDE

Professional competence





ACHIEVING COHERENCE

OBE-ALIGNED VERSION OF THE PSG for BSEE

Engr. CESAR CORONADO

TPET Member, TCEE Chairman

PROGRAM SPECIFICATIONS

I. Program Description

Degree Name

The degree program herein shall be called **BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING (BSEE).**

Nature of the Field of Study

The fields of specialization may include, among others, the following:

- Power System Operation and Protection
- Power Plant Operation and Maintenance
- Advanced Electrical Systems Design and Inspection
- Sales and Entrepreneurship
- Engineering Education and Research
- Instrumentation and Control Systems
- Construction and Project Management
- Software Development
- Consultancy
- Electricity Market

Sample Program Expected Outcome

The BSEE program shall develop graduates who:

1. *Are fully equipped with the fundamentals of electrical engineering that will allow them to be immediately competitive in industry, conduct research activities or pursue graduate studies while providing the best opportunity for achieving their full potential; and*
2. *Can work independently and/or in teams of related fields with minimal supervision.*

Specific Professions/Careers/Occupations for Graduates

The graduates of the BSEE program may practice as a/an:

- Construction and Project engineer/ manager
- Power Plant administrator/manager
- Instrumentation and Control Systems engineer
- Power Systems engineer/manager
- Electrical Systems Software developer
- Electrical Design manager/inspector/evaluator/estimator
- Maintenance engineer
- Technopreneur and/or Sales engineer
- Educator and/or Researcher
- Electrical consultant
- Electricity Market trader
- Electrotechnical officer

Allied Programs

The following programs may be considered as allied to Electrical Engineering:

- Computer Engineering
- Electronics Engineering
- Computer Science
- Information Technology
- Mechanical Engineering
- Industrial Engineering
- Audio Engineering
- Chemical Engineering
- Marine Engineering

2.1 – 2.3 Required Minimum Set of Student/Program Outcomes for BSEE

The graduates of the BSEE program should have developed the ability to:

a) Articulate and discuss the latest developments in the specific field of practice ***(PQF level 6 descriptor)*;**

b) Effectively communicate orally and in writing;

c) Work effectively and independently in multi-disciplinary and multi-cultural teams ***(PQF level 6 descriptor);***

d) Act in recognition of professional, social, and ethical responsibilities;

e) Preserve and promote "*Filipino historical and cultural heritage*" **(based on RA 7722);**

f) Apply knowledge of mathematics and sciences to solve engineering problems;
g) Design and conduct experiments, as well as to analyze and interpret data;
h) Design a system, component, or process to meet desired needs within realistic constraints, in accordance with standards;
i) Identify, formulate and solve engineering problems;
j) Understand the impact of engineering solutions in a global, economic, environmental, and societal context;

k) Recognize the need for and engage in life-long learning;

l) Apply techniques, skills, and modern engineering tools necessary for engineering practice;

m) Know and understand engineering and management principles as a member and/or leader in a team to manage projects in multidisciplinary environments;

n) Assess and evaluate power systems operations under normal and abnormal conditions; and

o) Analyze the operating principles related to power generation from non-conventional sources of energy

BSEE CURRICULUM

I. Curriculum Description

The curriculum has a minimum total of 221 credit units, comprising of 168 units of technical courses.

The technical courses include 26 units of mathematics, 12 units of natural/physical sciences, 21 units of basic engineering sciences, 44 units of allied courses, 53 units of professional courses, and 12 units of technical electives.

Classification/ Field	Total no. of Hours		Total No. of Units
	Lecture	Lab	
I. Technical Courses			
A. Mathematics	26	0	26
B. Natural Sciences	9	9	12
C. Basic Engineering Sciences	17	12	21
D. Allied Courses	36	24	44
E. Professional Courses	37	39	53
F. Electives	12	0	12
TOTAL (TECHNICAL)	**137**	**324**	**168**
II. Non-Technical Courses			
A. Social Sciences	12	0	12
B. Humanities	9	0	9
C. Language	15	0	15
D. Mandated Course	3	0	3
Physical Education			**8**
NSTP			**6**
TOTAL (NON-TECHNICAL)			**53**
GRAND TOTAL	**176**	**324**	**221**

IMPACT OF K12 TO HEIS AND LABOR

THE IMPACT OF K-12 ON HEIs AND THEIR PERSONNEL

Note: ***The figures herein are moving estimates based on 65% submission rate and will be refined iteratively by December 2014 when the data retrieval rate would have reached 100%***

Impact on HEIs: Philippine Higher Education Landscape

Distribution of Higher Education Institutions (HEIs)

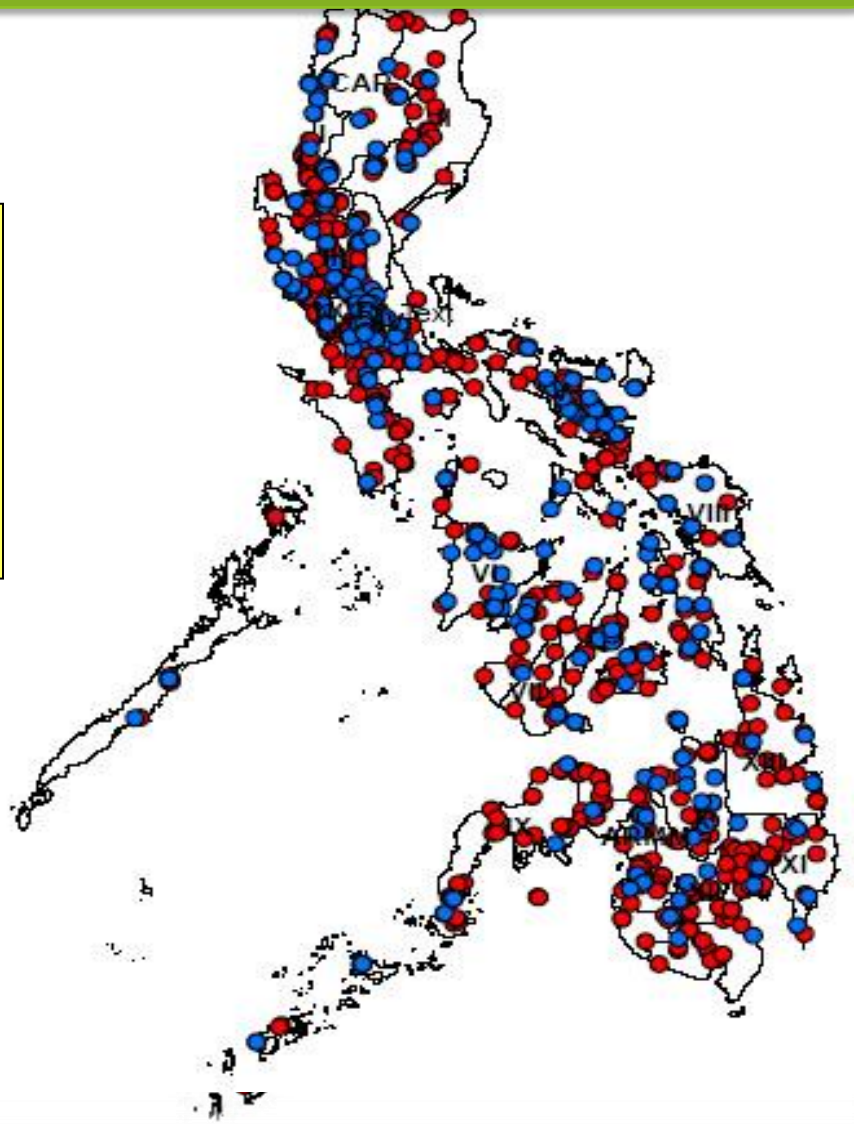
- Public = 219 (12%)
- Private = 1,652 (88%)

Total = 1,871

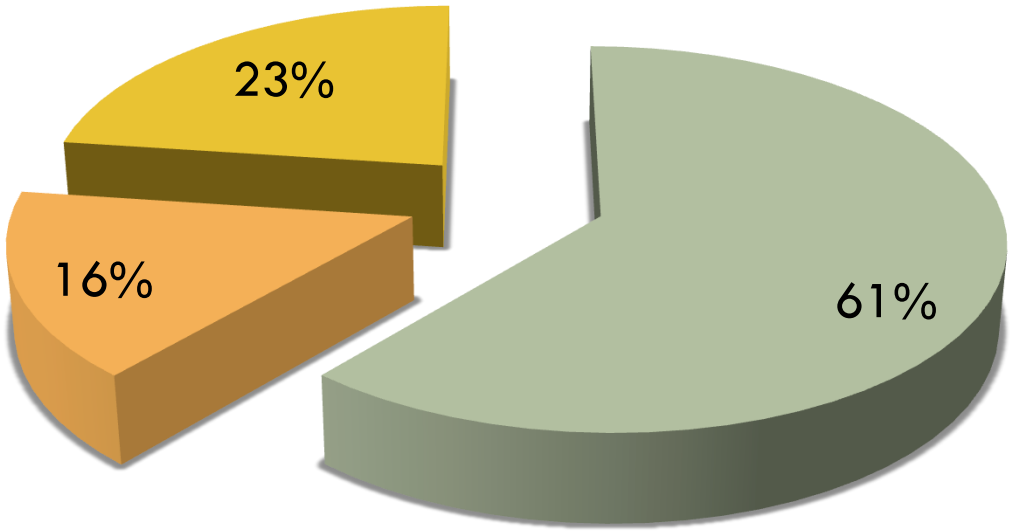
(excluding 442 SUCs satellite campuses)

Distribution of Students

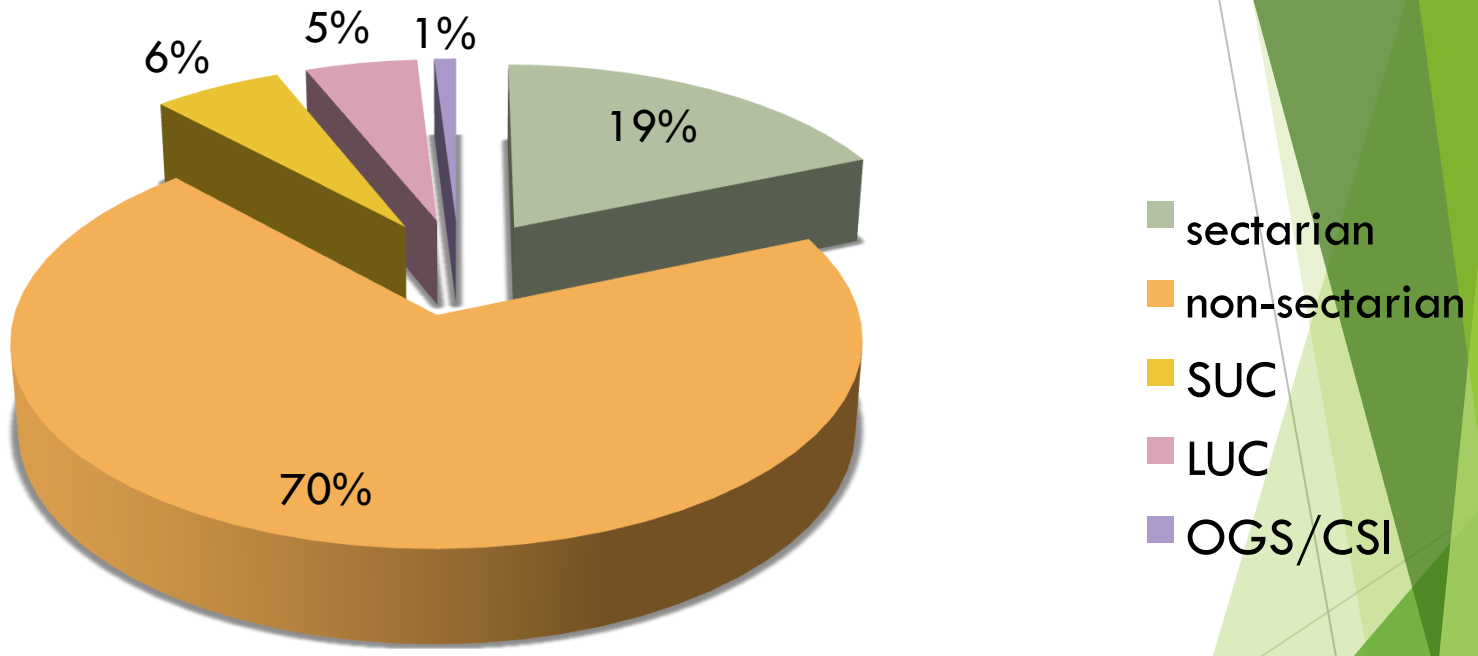
Public = 1.42M (43%)
Private = 1.89M (57%)
Total = 3.3M



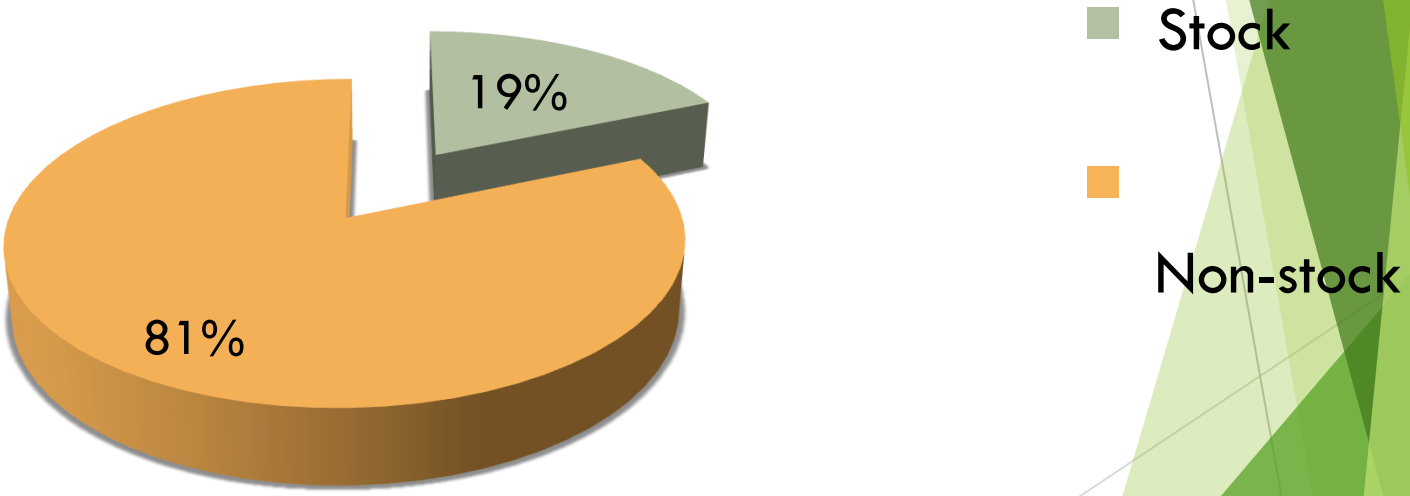
Distribution of HEIs by Regional Cluster



Distribution of HEIs by Type

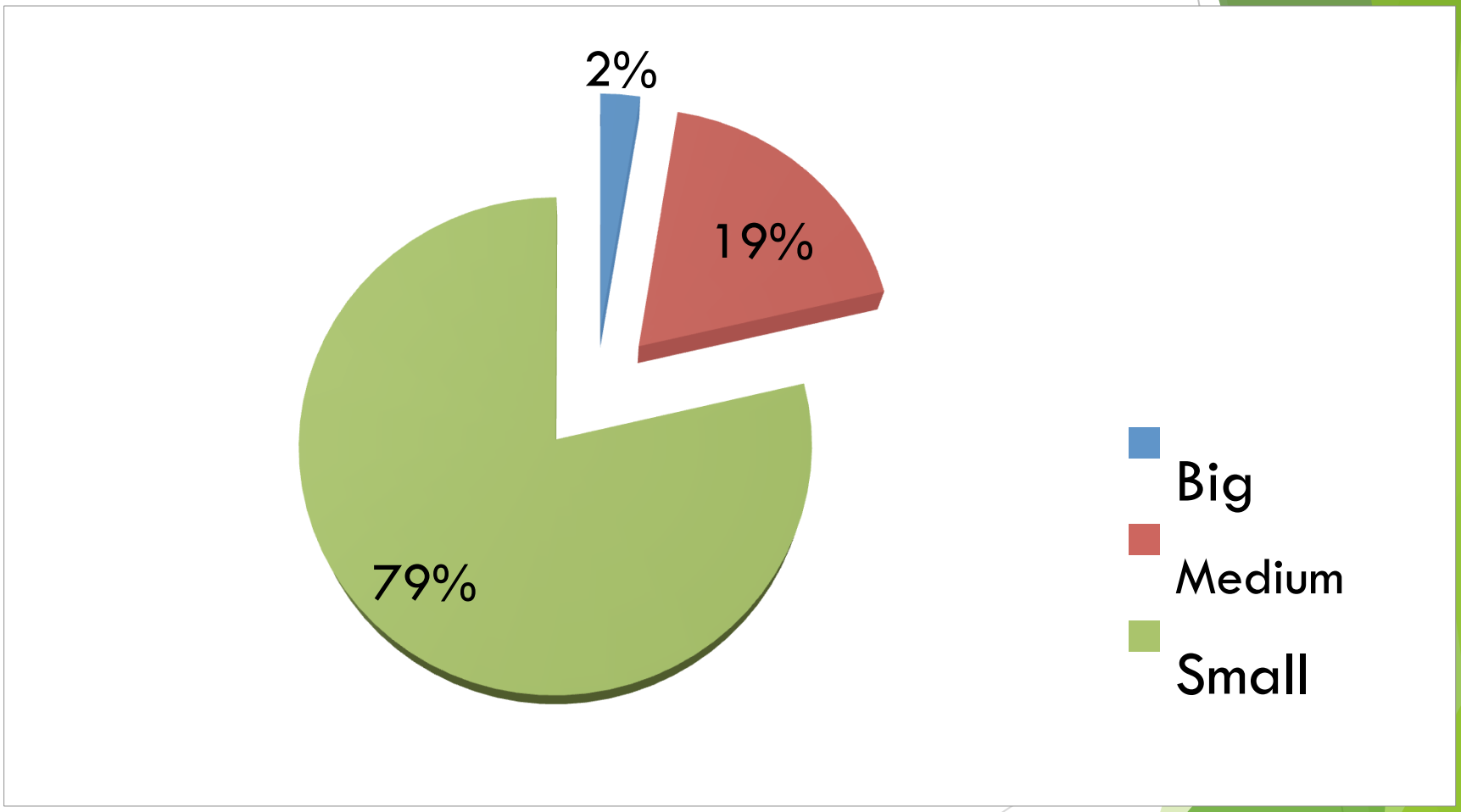


Distribution of Private Non-sectarian HEIs by Type

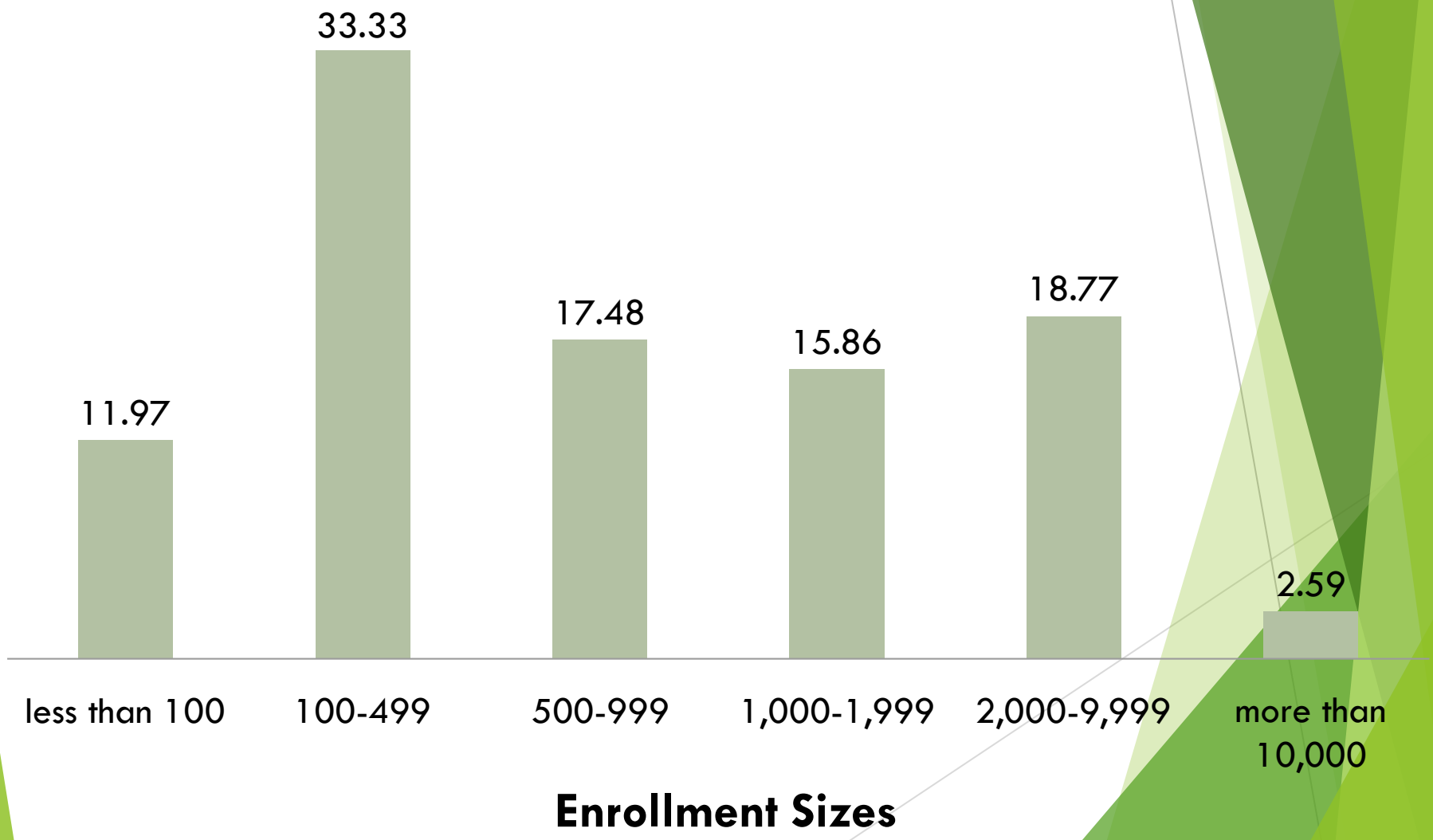


Distribution of HEIs by Size of College Enrollment

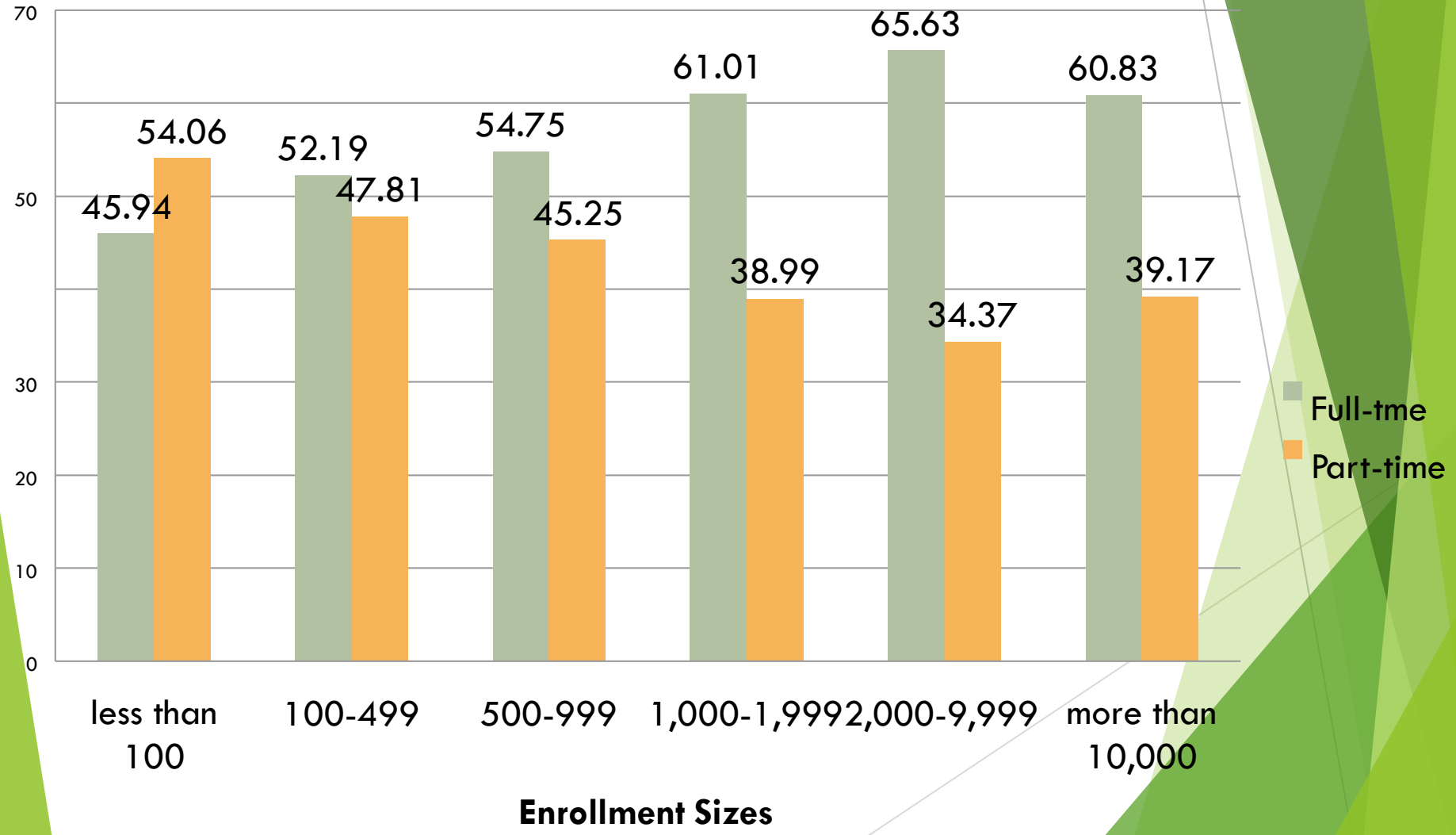
(Big=10000+; Medium=2000-9999; Small=<2000)



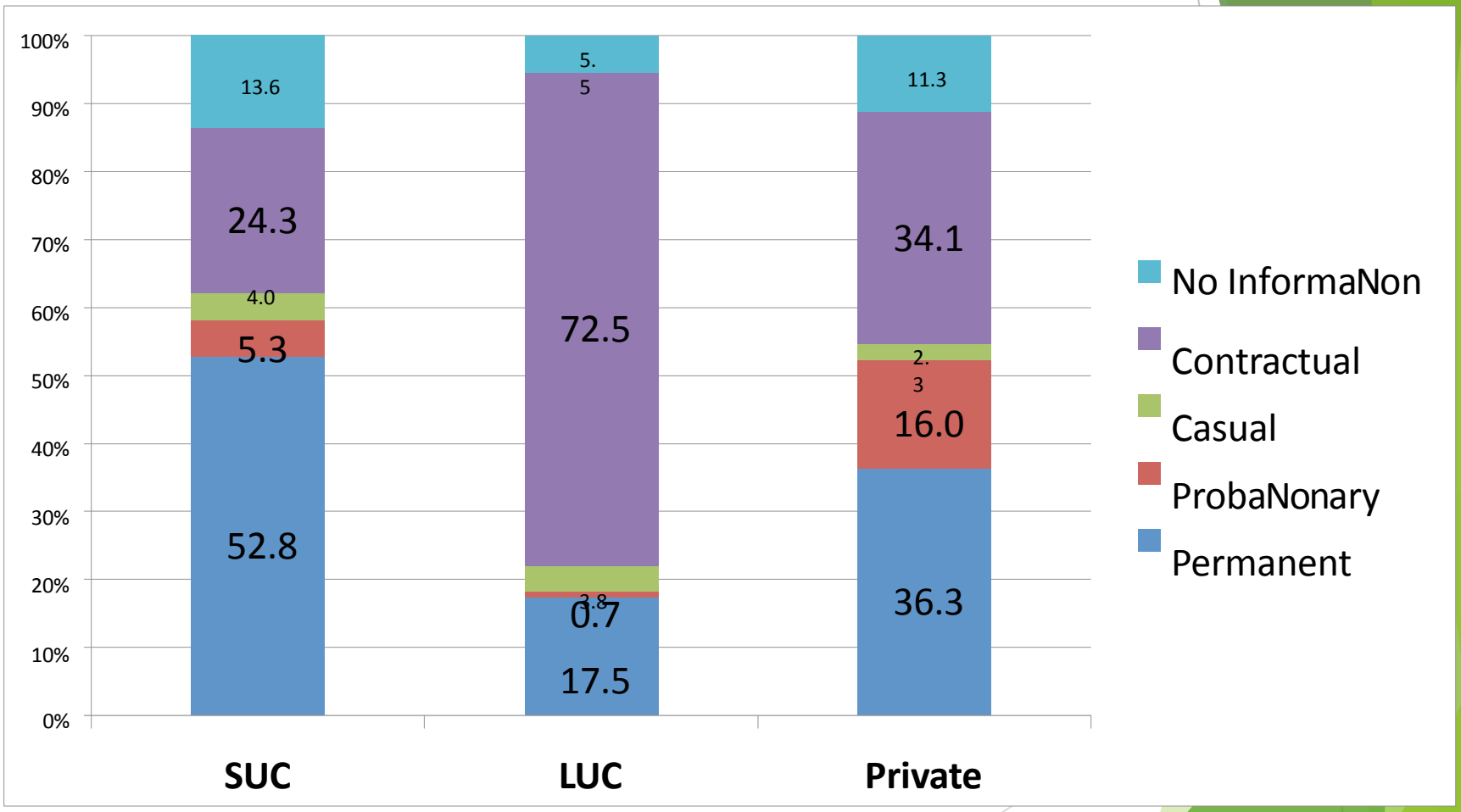
Percent Distribution of HEIs Across College Enrollment Sizes



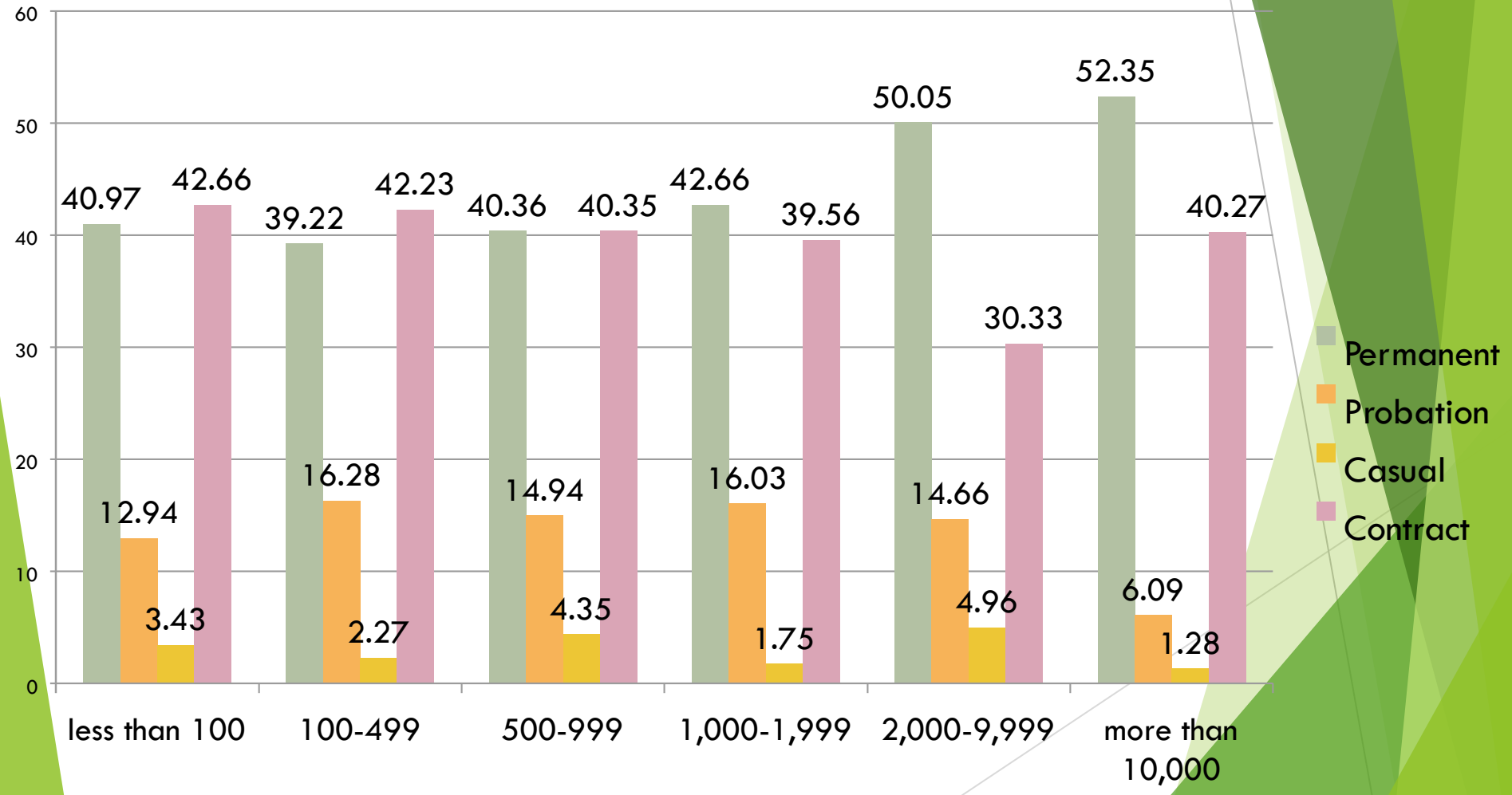
Percent Distribution of Faculty According to Employment Status by HEI Size [College enrollment only]



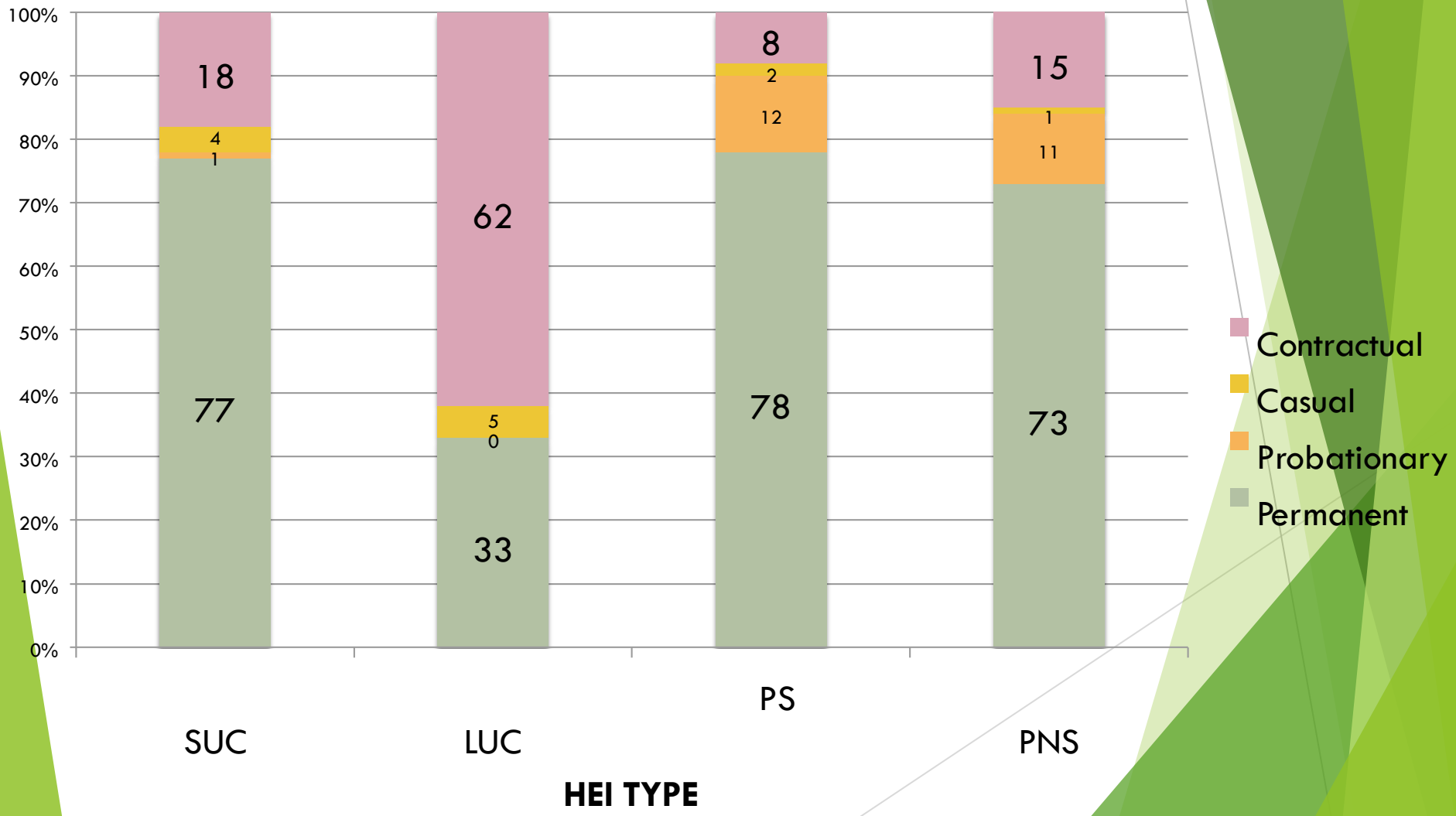
Percent Distribution of Faculty by Tenure of Employment and HEI Type



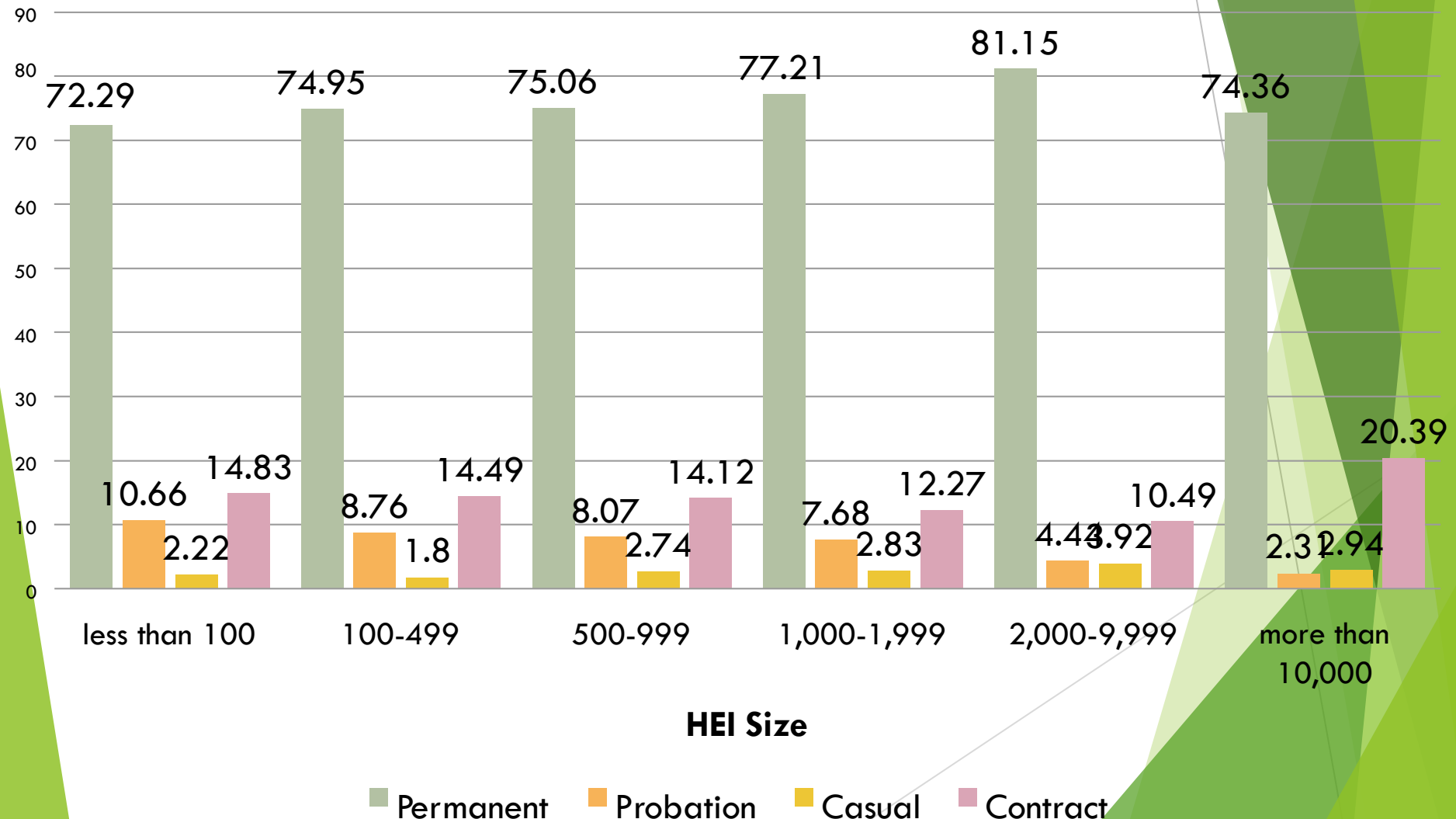
Percent Distribution of Faculty According to Tenure by Enrollment Size [College enrolment only]



Percent Distribution of Non-Teaching Staff by Tenure of Employment and HEI Type [college enrollment only]



Percent Distribution of Non-Teaching Staff According to Tenure by HEI Size (College Enrollment only)



Estimates of Affected Teaching and Non-Teaching Personnel

- The following estimates of potential displacements are only for permanent faculty and non-teaching personnel who have legal entitlements
- **HOWEVER**, estimates of the probationary and contractual staff are presented in this ppt without any assumption of who among them will be affected.
- Estimates of who will be affected and the possible options will be provided in the second iteration estimates by the end of December 2014;

Preliminary Estimates: Permanent Faculty

Type of Faculty	Total	Public	Private
Teaches only GE	4845	2424	3566
Teaches some GE	41993	23425	28688
Does not Teach GE	2018	431	1604
Still unclassified	4214	4148	1779
Total Permanent	53,070	30428	35637
Total Faculty	130,806	58627	99658

POTENTIAL DISPLACEMENT: PERMANENT FACULTY

Faculty Teaching Only GE courses:

- *Permanent Faculty Teaching Only GE courses:*

  4,845 (4% of total; 9% of permanent)

SUC:	2,425	(2% of total)
LUC:	46	(.04% of total)
Private Sectarian:	735	(1% of total)
Private Non-Sectarian:	2,814	(2% of total)

- *Permanent Full-time Faculty Teaching Only GE: 4,181 (3% of total)*

PotentiaL Displacement and Cost: PERMANENT FACULTY

Permanent Faculty Teaching Some GE: 41,993

- *Permanent Full-time Faculty Teaching Some GE: 37,697*

<u>Cost of Retrenchment (Permanent, Full-time):</u> PhP9.8 B

Assumptions:

- P30,000 per month for 24 months
- All GE only permanent full-time teachers will be retrenched
- 25% of some permanent full-time teachers teaching some GE courses will be retrenched [by 2018]. Note: this may be on the high side because a significant number of the best HEI teachers teach some GEs

Potential Displacement and Cost Non-Teaching Personnel (NTP): PERMANENT NTP

- **Permanent Full-time Non-Teaching Personnel**: 26,872

Cost of Retrenchment:

- 25% Retrenchment: P2.4B
- 50% Retrenchment: P4.8B

Assumptions:

- P15,000 for 24 months

Estimates of Contractual Faculty

- **Estimate of Probationary and Contractual Faculty (as of October 2014)**

Tenure	SUCs	LUCs	Private Non-sectarian	Private Sectarian	TOTAL
Probationary	2235	42	10246	2805	15328
Contractual	10405	2497	20875	7351	41128
TOTAL	27835	2315	41032	13460	84642

- **Estimate of Probationary and Contractual <u>to be Affected</u> and Potential Options for Mitigating the Impact [to be given in December 2014]**

Estimates of Contractual Non- Teaching Staff

- **Estimate of Probationary and Contractual Non-Teaching Staff (as of October 2014)**

Tenure	SUCs	LUCs	Private Non-sectarian	Private Sectarian	TOTAL
Probationary	160	3	2252	745	3160
Contractual	4385	523	2217	439	7564
TOTAL	4545	526	4469	1184	10724

- **Estimate of Probationary and Contractual <u>to be Affected</u> and Potential Options for Mitigating the Impact [to be given in December 2014]**

ESTIMATE of the TESTF

- The Inter-Agency Team will work within the P29B estimate in July 2014 for now

NEXT STEPS: Management of the Transition to K12

- Finalize in consultation with PASUC re: the policy on the offering of K to 12 by SUCs
- Organize a mentoring system where more stable HEIs that have adjustment plans assist smaller institutions
- Work on the mechanics of CHED's assistance to DepEd in the management of the transition to K to 12 of higher educations that will offer K to 12 (academic track) up to 2017.
- Work on the mechanics and training of trainers for the retooling of about 467,000 public school teachers for K to 12 by HEIs in the transition years;

IMPACT OF K-12 TO EE EDUCATION

- **Better Quality, Globally Comparable but Fewer Students in EE Education during in the initial phase**

High school graduates better prepared for higher education

- Better mastery of basics
- Remedial courses no longer necessary

High school graduates better prepared for work

- More graduates will go directly to work
- Development of a National Qualifications Framework

CHALLENGES OF K-12 TO EE EDUCATION

- **Curricular and Program Changes**
  1. ***Revised General Education Curriculum***
  2. ***Implementation of OBE curriculum for BSEE***
  3. ***Possibly shorter EE Academic Programs***
  4. ***More Ladderized/Associate programs***
- **Economically Challenged Engineering Education Institutions and Internal Stakeholders in the transition**

- Born into poverty, HE was faced with defeat throughout his life.
- His family was forced out of their home. He had to work to support them.
- He was to be married when his sweetheart died and suffered nervous breakdown
- He failed twice in business
- He lost eight elections
- He could have quit many times – but he didn’t and because he didn’t quit!

"Always bear in mind that your *own resolution to succeed* is more important than any other one thing" – *Abraham Lincoln*

The Greatest American President, elected 1860

MABUHAY IIEE!

THANK YOU