



PARADIGMA BARU PEMBELAJARAN VOKASIONAL

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Jurusan Pendidikan Teknik Elektronika Informatika FT UNY

Prodi Pendidikan Teknologi dan Kejuruan

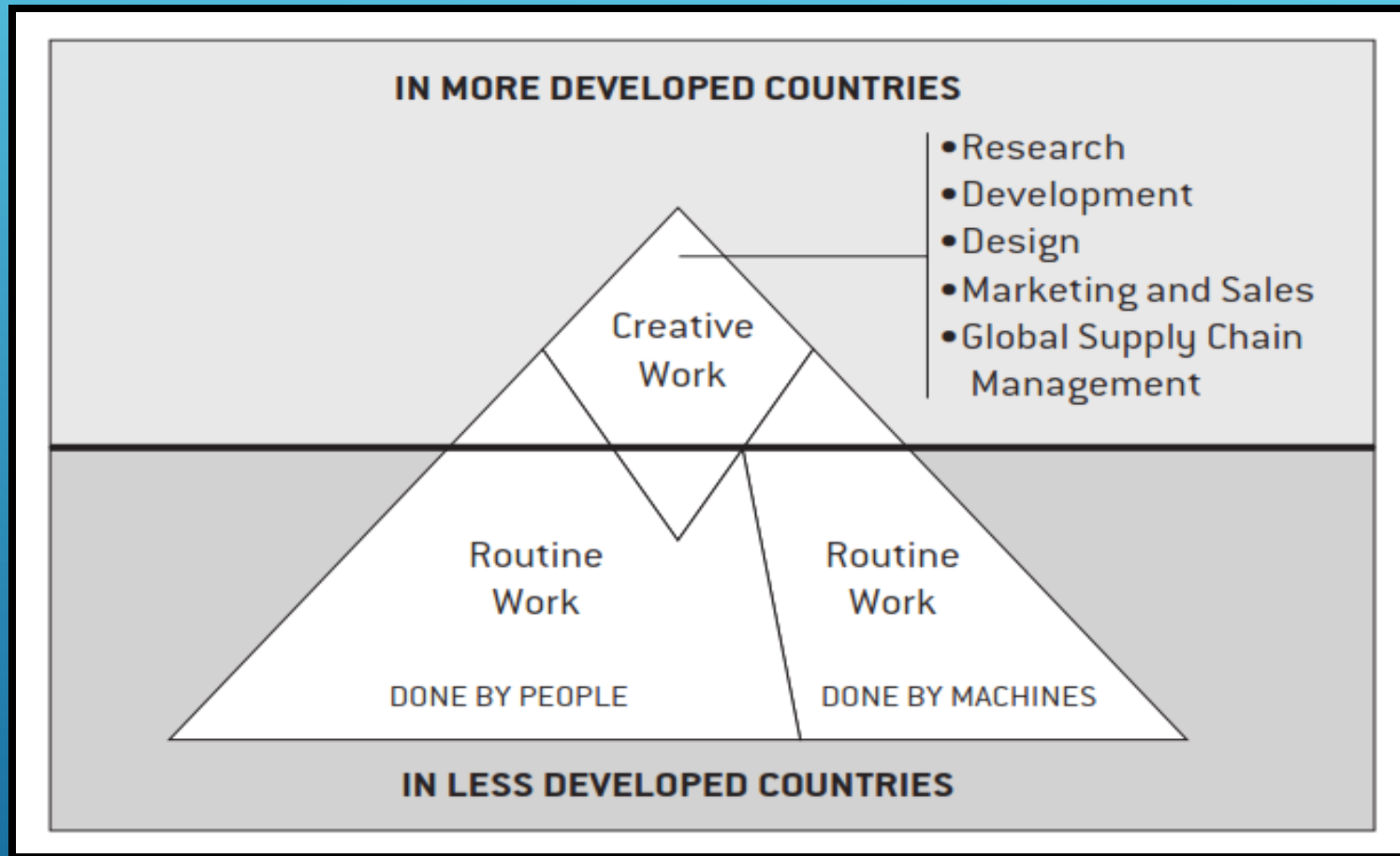
Pascasarjana Universitas Negeri Yogyakarta

5 Pebruari 2022

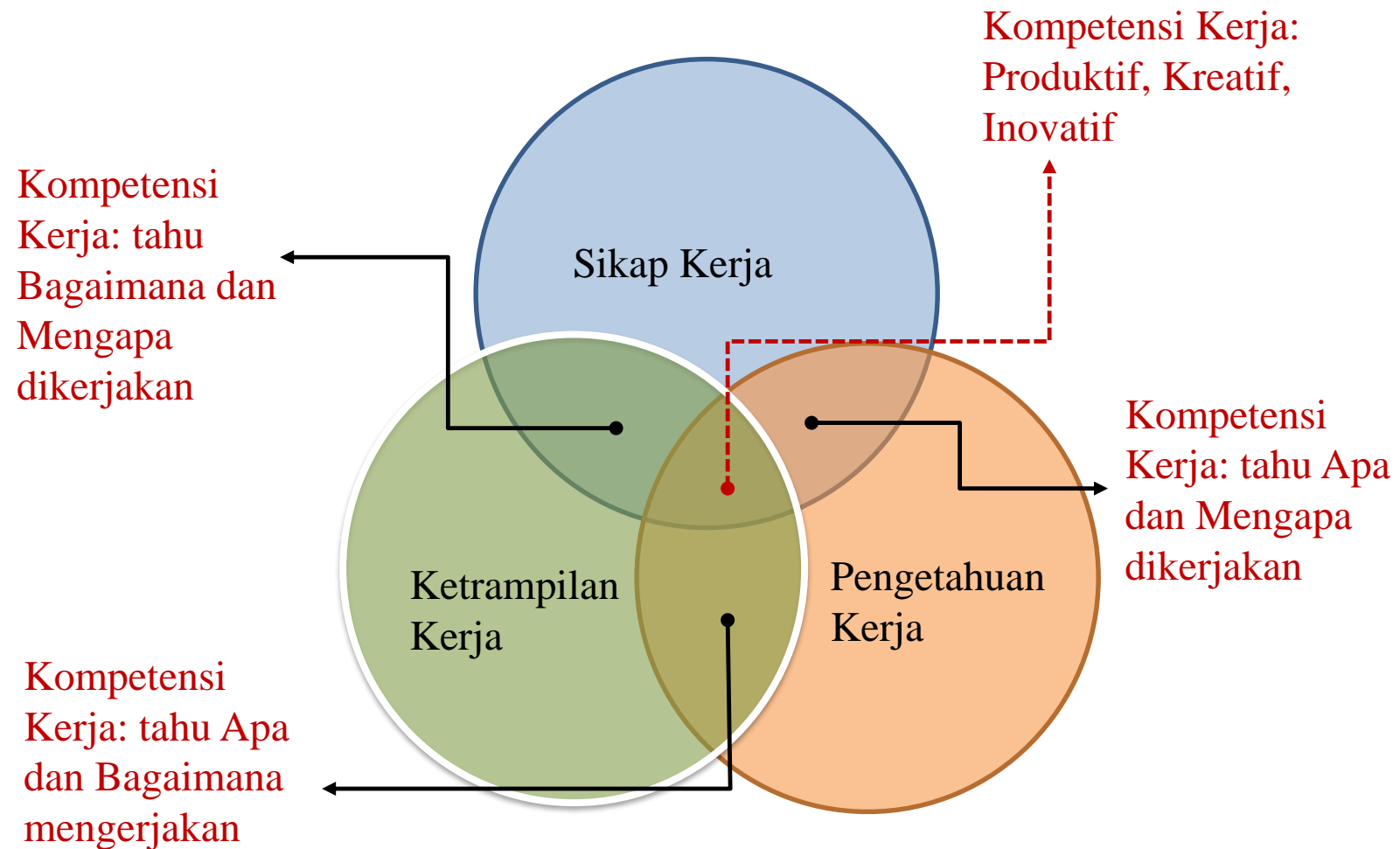
Pendidikan Kejuruan di SMK

- *Vocational Education*
- *Pendidikan Vokasional*
- *Education for Occupations*
- *Education for Vocation*
- ~~PENDIDIKAN VOKASIONAL atau VOCATION EDUCATION~~

POLA PEKERJAAN



STRUKTUR KOMPETENSI KERJA

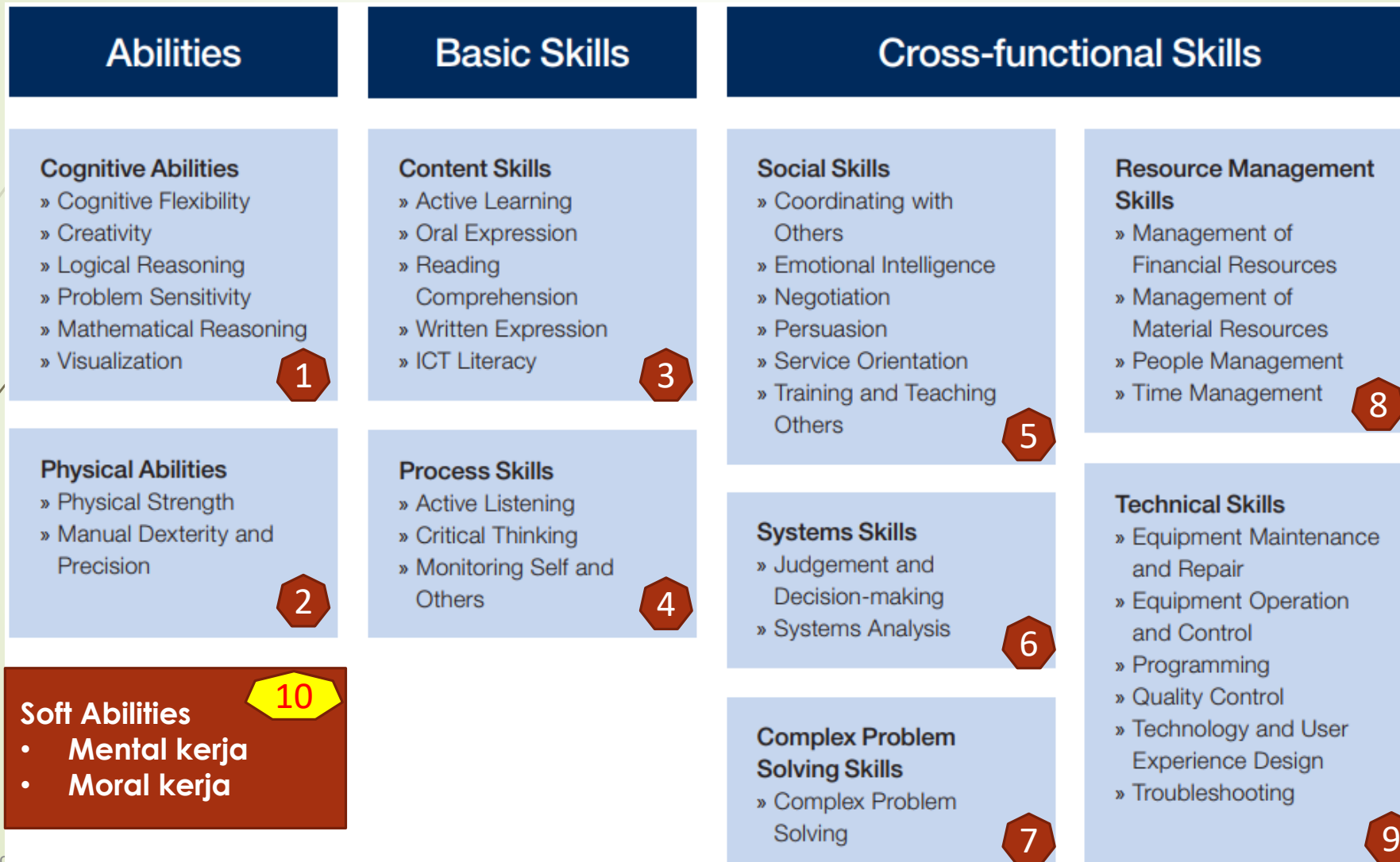




Makna Pendidikan Kejuruan

- *Vocational education as education designed to develop **skills, abilities, understandings, attitudes, work habits, and appreciations** needed by workers to **enter and make progress** in employment on **useful and productive basis**” (American Vocational Association dalam Thompson, 1973:111).*

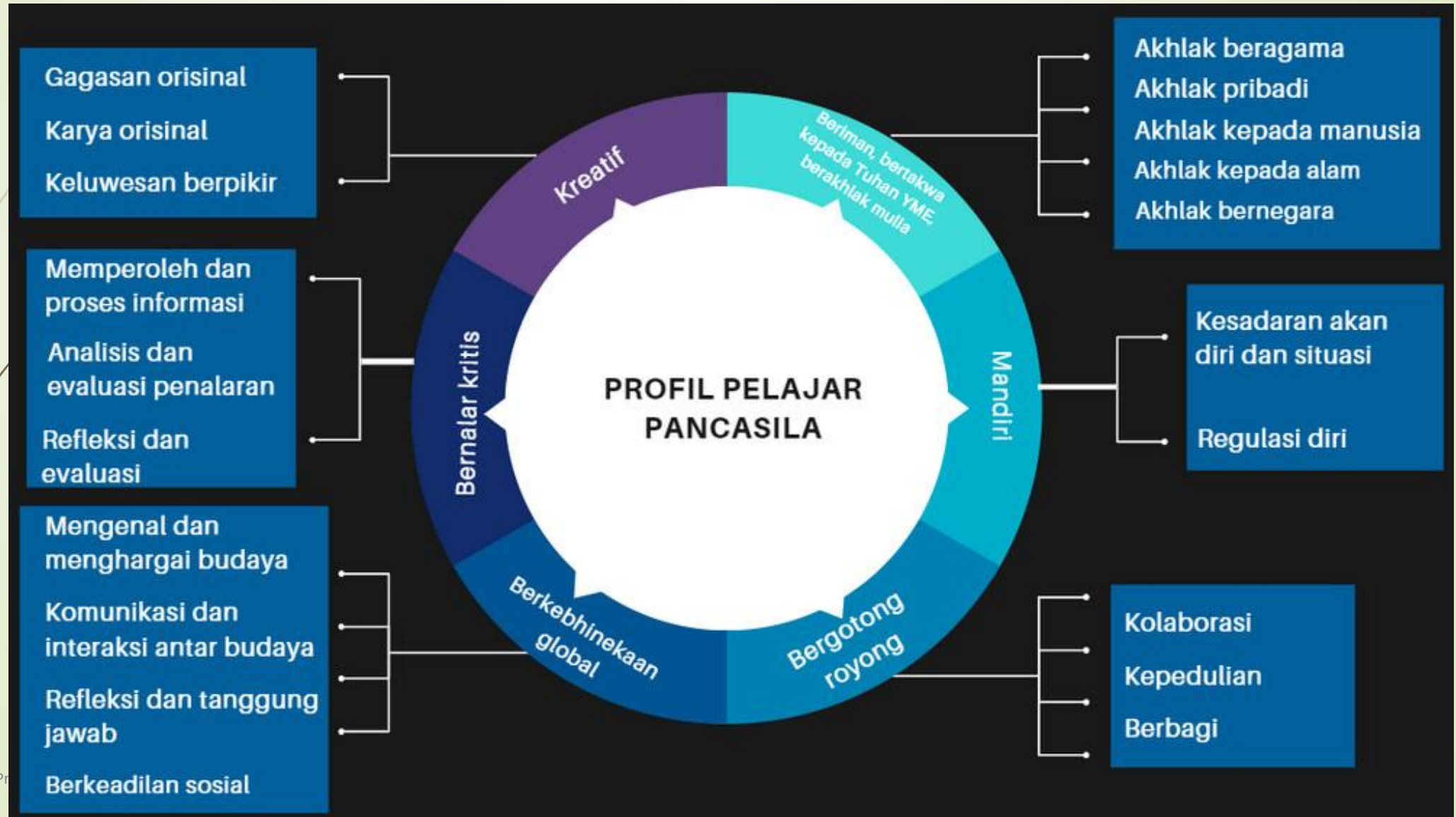
VOCATIONAL ABILITIES & SKILLS





PEMBELAJARAN VOKASIONAL BERSIFAT PENGEMBANGAN KOMPETENSI/ SKILL KERJA PERSONAL, KEPRIBADIAN KERJA, PENGEMBANGAN KARIR PROFESI

PROFIL PELAJAR PANCASILA



TRANSFORMASI DIGITAL

Diberi Pengalaman Mengenal

- ❖ Cara baru menjalankan kehidupan kerja
- ❖ Cara baru menjalankan tugas-tugas kerja
- ❖ Cara baru belajar & memecahkan masalah kerja
- ❖ Cara baru memproduksi dan melakukan service
- ❖ Cara baru melakukan layanan kepada publik
- ❖ Cara baru bertani, mengobati pasien,
- ❖ Cara baru berbisnis, berkomunikasi, mendapat informasi
- ❖ Cara baru menganalisis data



Facilitator
Organizer
Coach
Adviser
Moderator



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Facilitator
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Pembelajaran Vokasional

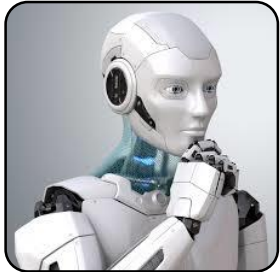
Memperhatikan secara Seksama



Sistem Informasi Pekerjaan dan Ketenaga Kerjaan

- ❖ Jenis-jenis pekerjaan apa yang tersedia
- ❖ masa inkubasi setiap jenis pekerjaan
- ❖ kapasitas jumlah ketersediaan lowongan pekerjaan
- ❖ sebaran wilayah kebutuhan lapangan kerja
- ❖ bagaimana setiap orang dapat berpartisipasi dalam pekerjaan tersebut
- ❖ bagaimana peluang-peluang karir dimasa depan yang memungkinkan
- ❖ Kompetensi (skill) apa yang dibutuhkan dalam bekerja dan berkarir
- ❖ Bagaimana jaminan kesejahteraan masa depannya





- 4.0 **Bagaimana dunia kerja era Tranformasi Digital dan Revolusi Industri 4,0 berubah dan apa maknanya bagi TVET dan Pembelajaran Vokasional**
- 4.0 **Seberapa banyak Perangkat Cerdas Berteknologi Digital memadai diterapkan**
- 4.0 **Seberapa banyak SDM yang Kapabel dan Tidak Kapabel Bekerja pada Industri 4,0, Seperti apa formasi kebutuhan SDM era Revolusi Industri 4,0;**
- 4.0 **Kapabilitas dan *Employability Skill* apa saja yang dibutuhkan untuk Bekerja dan Berkarir pada Industri 4,0**
- 4.0 **Apa saja yang perlu dipelajari agar mampu bersaing bekerja dan berkarir di era Transformasi Digital dan Revolusi Industri 4,0**
- 4.0 **Bagaimana TVET merumuskan dan mengemas Kurikulum dan Program-program Pembelajaran yang relevan dengan Industri 4,0**
- 4.0 **Bagaimana Pembelajaran Vokasional didisain memenuhi Kebutuhan Belajar era Transformasi Digital dan Revolusi Industri 4,0**
- 4.0 **Seperti apa Model-Model Pembelajaran Vokasional baru yang Cocok untuk Transformasi Digital dan Revolusi Industri 4,0**

PROSES KONSTRUKSI PENGETAHUAN, SIKAP & SKILL



MODIFIKASI PENGALAMAN BARU SESUAI STRUKTUR KOGNITIF YANG DIMILIKI

PELAZIMAN, INTERAKSI SOSIAL, PENGKONDISIAN, AKTIVITAS MENTAL, MENTORING, AKTUALISASI POTENSI

1. Mengetahui (Faktual)
2. Memahami (Konseptual)
3. Menerapkan (Prosedural)
4. Menganalisis (Metakognisi)
5. Mengevaluasi (Metakognisi)
6. Mengkreasi (Metakognisi)



KONSTRUKSI KOGNITIF



KONSTRUKSI APEKTIF



KONSTRUKSI SKILL

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Menerima 2. Menanggapi 3. Menghargai 4. Menghayati 5. Mengamalkan | Tata Nilai Pengetahuan, Sains, Teknologi, Seni, Agama |
|--|---|

- Skill Abstrak **(SKILL BERPIKIR-BERKATA)**
1. Mengamati; 2. Menanya
 3. Mencoba; 4. Menalar
 5. Menyaji; 6. Mencipta

- Skill Konkret **(SKILL GERAK)**
1. Meniru
 2. Membiasakan
 3. Mahir
 4. Alami
 5. Orisinil

MODIFIKASI STRUKTUR KOGNITIF SESUAI PENGALAMAN BARU YANG DIDAPAT



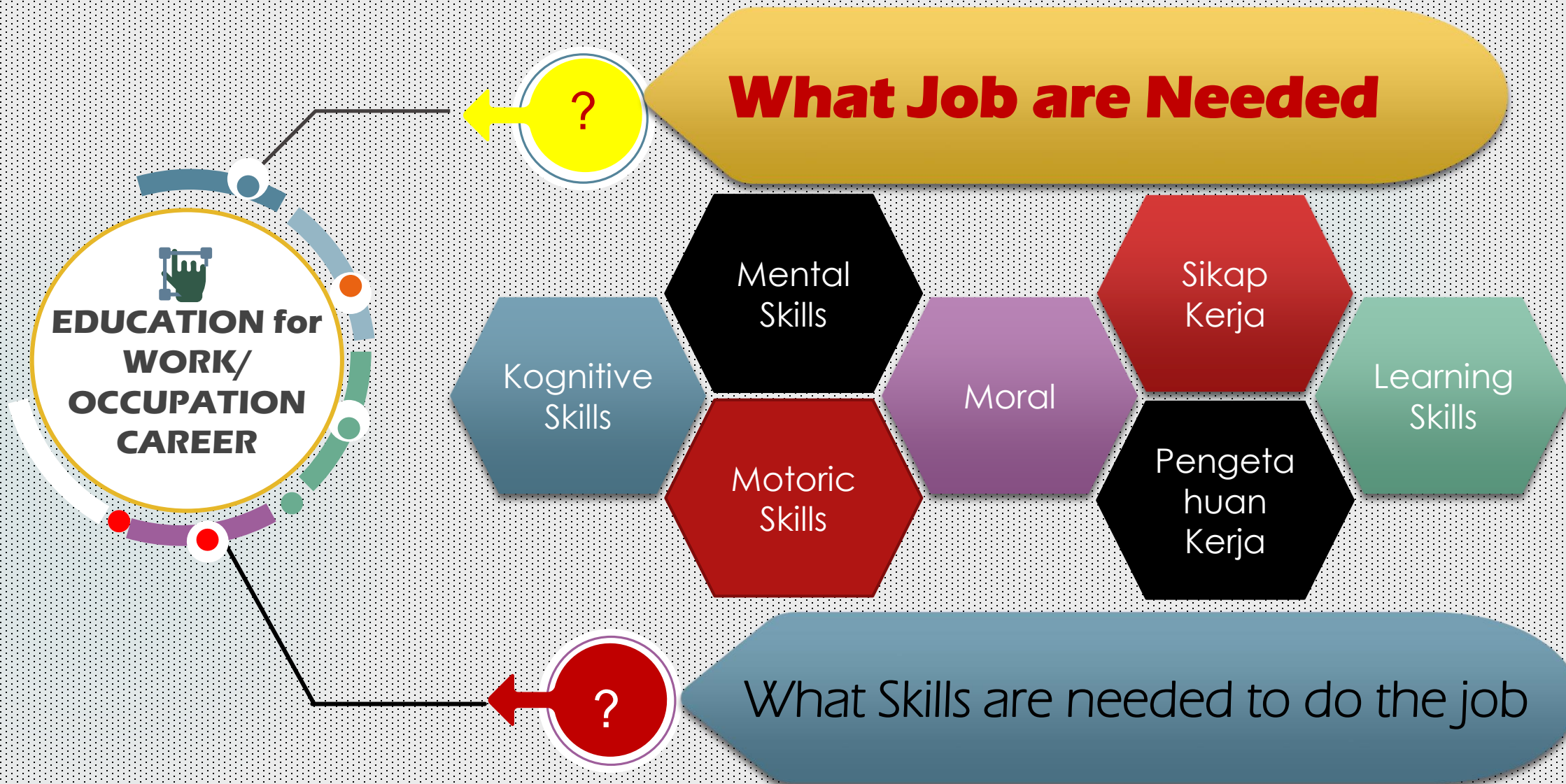
Ki Panji



FILOSOFI PEMBELAJARAN TVET



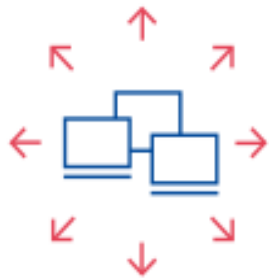
Ki Panji





TVET BERSIFAT PENGEMBANGAN KOMPETENSI/SKILL KERJA PERSONAL, KEPRIBADIAN KERJA, PENGEMBANGAN KARIR PROFESI → **TVET PERSONAL. BUKAN SEKEDAR PERSOALAN MEMBUAT BARANG/JASA**

LIMA Teknologi Pemacu Inovasi TVET



UBIQUITOUS COMPUTING

Access to computing power any time, anywhere

1



COLLABORATION TECHNOLOGIES

Ability to collaborate with anyone in real time

2



EXTENDED REALITY

Ability to digitally simulate reality and to integrate digital and physical worlds

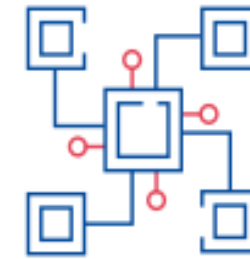
3



ARTIFICIAL INTELLIGENCE

Ability for machines to learn on their own, and interact in a human-like manner

4



BLOCKCHAIN

Ability to use computers with guarantees as to privacy and security

5

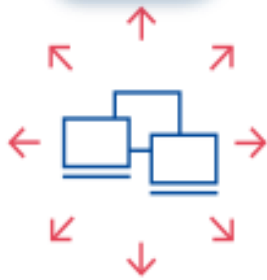
Source: Grech and Camilleri (2017).



LIMA Teknologi Pemacu Inovasi TVET



1



UBIQUITOUS COMPUTING

Access to computing power any time, anywhere



1. give people access to information and computing power through the worldwide web

2. applications of digital learning

High Speed Internet



BROADBAND

3G, 4G, 5G Wireless Delivery



MOBILE BROADBAND

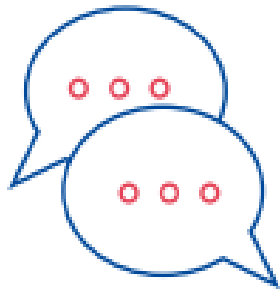
Computing from local device to Data Centre



CLOUD COMPUTING



LIMA Teknologi Pemacu Inovasi TVET



COLLABORATION TECHNOLOGIES

Ability to collaborate with anyone in real time

2



LIMA Teknologi Pemacu Inovasi TVET



3



EXTENDED REALITY

Ability to digitally simulate reality and to integrate digital and physical worlds



VIRTUAL REALITY



AUGMENTED REALITY



MIXED REALITY



LIMA **Teknologi Pemacu Inovasi** TVET



computers to learn and interact similarly to humans

Natural language processing

powering search engines, chatbots or help forums that can answer student questions phrased in natural language



translating educational materials

Providing artificial mentorship, or step-by-step instructions in practical contexts



ARTIFICIAL INTELLIGENCE

Ability for machines to learn on their own, and interact in a human-like manner

Recommender systems



(a) educational/training resources; (b) learning opportunities; and (c) personalized career pathways, based on aptitude, educational goals and past performance

AI for teaching and assessment

4

LIMA Teknologi Pemacu Inovasi TVET



self-sovereignty, i.e. users can maintain direct control over the storage and management of their personal data

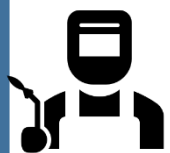
trust, i.e. the technical infrastructure gives people enough confidence in its operations to carry through with transactions such as payments or the issuance of certificates



transparency and provenance, i.e. users can conduct transactions with the knowledge that each party has the capacity to enter into that transaction

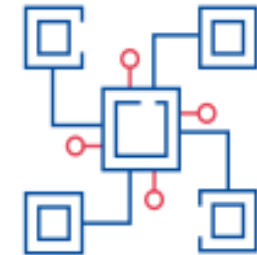
immutability, i.e. records can be written and stored permanently, without the possibility of modification

disintermediation, i.e. there is no more need for a central controlling authority to manage transactions or keep records



collaboration, i.e. parties have the ability to transact directly with each other, without the need for third parties

5



BLOCKCHAIN

Ability to use computers with guarantees as to privacy and security



ANATOMI PEMBELAJARAN VOKASIONAL "NEW"



Drones Logistic



Smart Machine

Robot Humaniod



Smart food



2022

Smart Phone Personal identities



2023

Smart Hospital



2024

2025

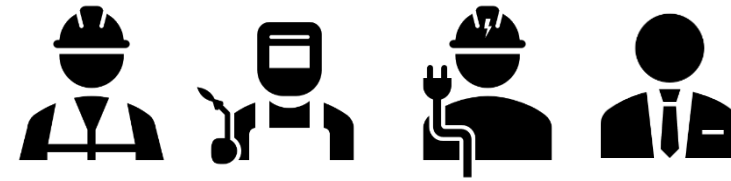
Top 10 skills of 2025

- Analytical thinking and innovation
- Active learning and learning strategies
- Complex problem-solving
- Critical thinking and analysis
- Creativity, originality and initiative
- Leadership and social influence
- Technology use, monitoring and control
- Technology design and programming
- Resilience, stress tolerance and flexibility
- Reasoning, problem-solving and ideation

Type of skill
 ● Problem-solving
 ● Self-management
 ● Working with people
 ● Technology use and development



Am I i.40 ready?



proactive learners who are continuously keeping themselves equipped and updated to be innovative and competitive

self-reliant
self-directed
lifelong
active

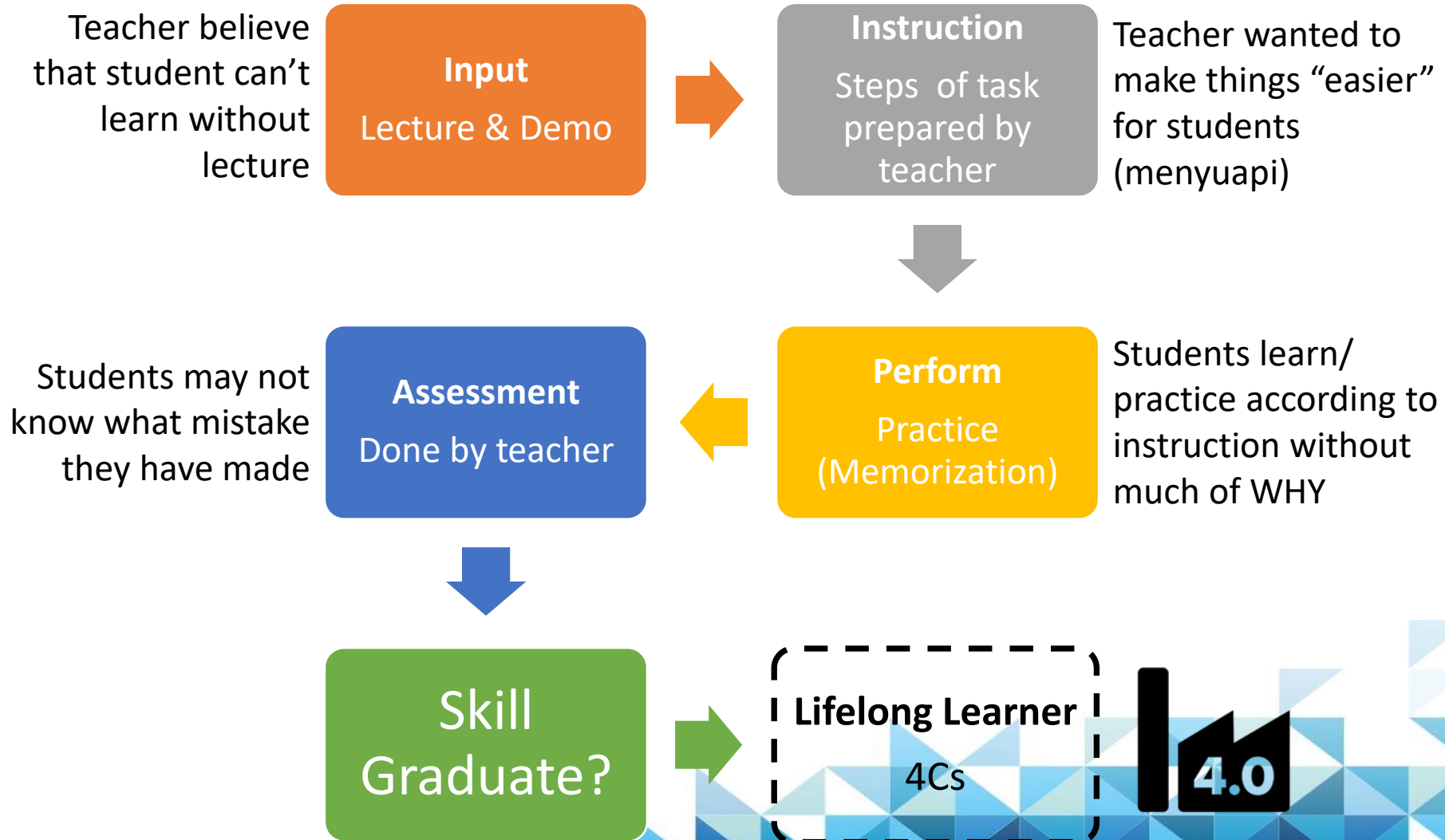
learner



how?



Teaching & Learning Scenario



Penguatan Merdeka Belajar



Diatur guru, pemahaman, recall, terkondisi dalam ruang kelas, sekolah, kampus, Ijazah, Transkrip Nilai

Mandiri mengatur diri, mencari dan menemukan berbagai pengalaman, Sertifikat Kompetensi

Berpikir kedepan, menentukan pengembangan karir diri, belajar sepanjang hayat, Prestasi, Karir

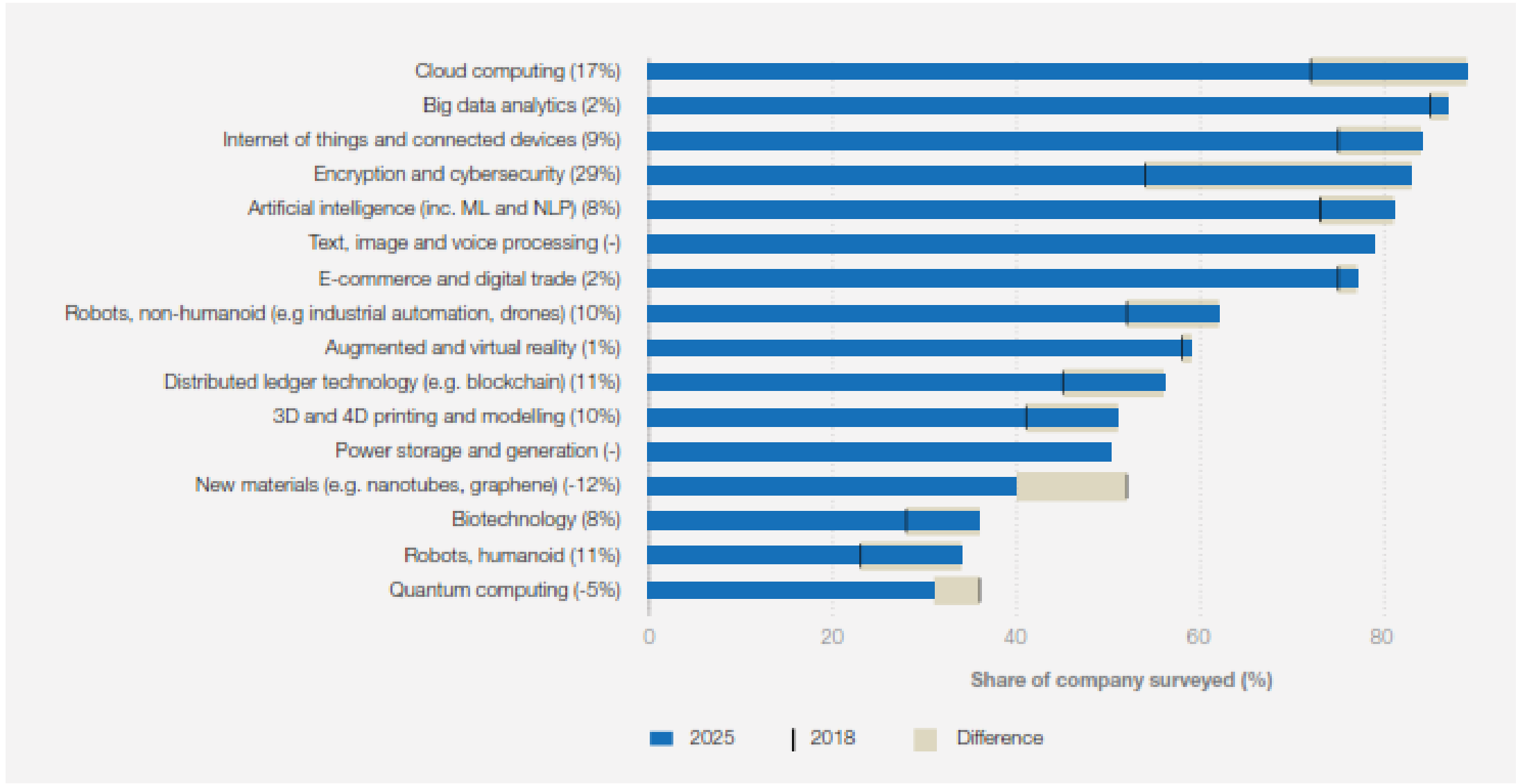
4C: Aktif membangun jejaring, komunikasi, kritis dan kreatif dalam berpikir, Skill-Kapabilitas Baru

Aktif mentautkan kreativitas melalui web 4.0, berkomunikasi berkolaborasi dalam Cyber, self regulated, ownership, generative, Inspirator, Manusia bermakna





TANTANGAN ADOPSI TEKNOLOGI DI TAHUN 2025



Top 10 skills of 2025



Type of skill

- Problem-solving
- Self-management
- Working with people
- Technology use and development



Analytical thinking and innovation



Active learning and learning strategies



Complex problem-solving



Critical thinking and analysis



Creativity, originality and initiative



Leadership and social influence



Technology use, monitoring and control



Technology design and programming



Resilience, stress tolerance and flexibility

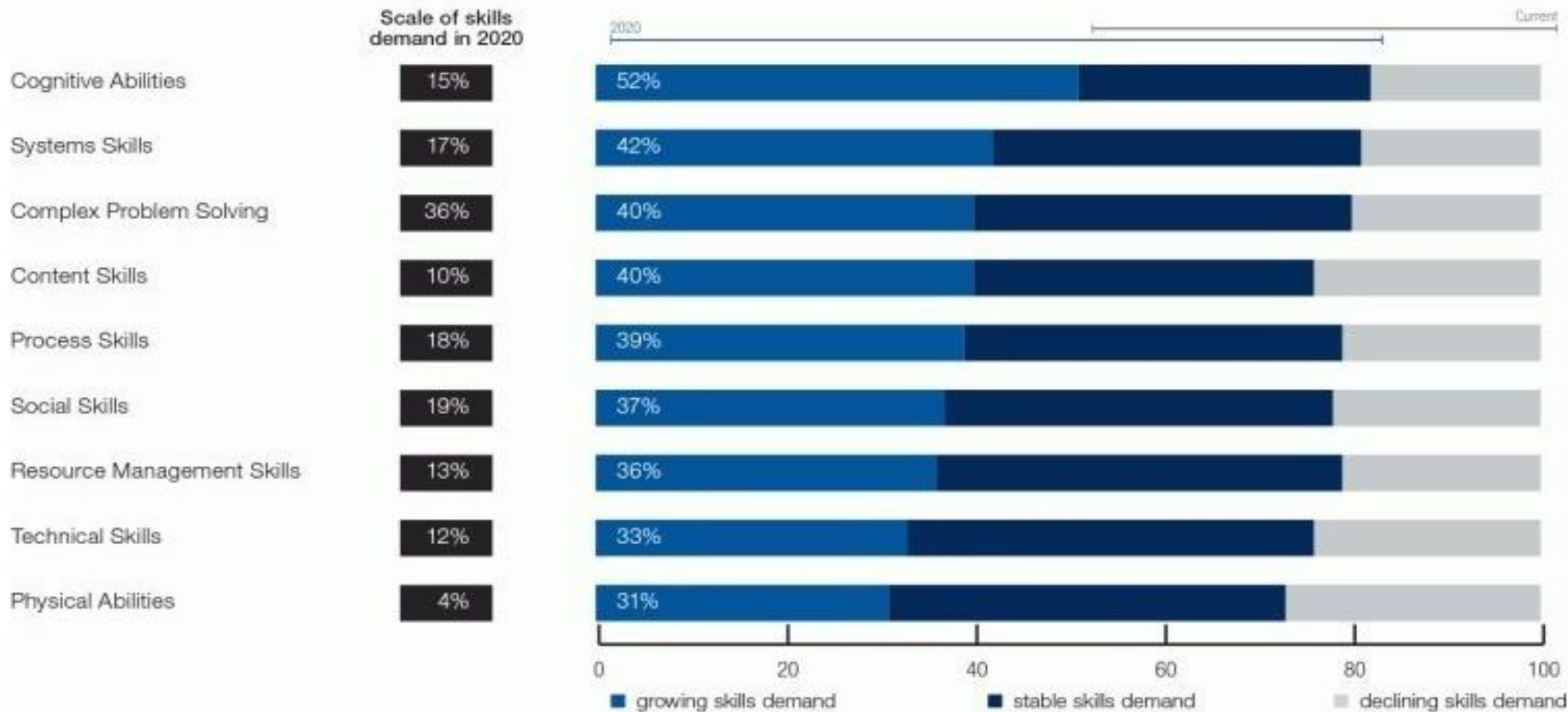


Reasoning, problem-solving and ideation





TANTANGAN PERUBAHAN KEBUTUHAN SKILL 2015-2020



Source: Future of Jobs Survey, World Economic Forum.



Growing



- 1 Analytical thinking and innovation
- 2 Active learning and learning strategies
- 3 Creativity, originality and initiative
- 4 Technology design and programming
- 5 Critical thinking and analysis
- 6 Complex problem-solving
- 7 Leadership and social influence
- 8 Emotional intelligence
- 9 Reasoning, problem-solving and ideation
- 10 Systems analysis and evaluation

Declining



- 1 Manual dexterity, endurance and precision
- 2 Memory, verbal, auditory and spatial abilities
- 3 Management of financial, material resources
- 4 Technology installation and maintenance
- 5 Reading, writing, math and active listening
- 6 Management of personnel
- 7 Quality control and safety awareness
- 8 Coordination and time management
- 9 Visual, auditory and speech abilities
- 10 Technology use, monitoring and control

What are the two(2) dominant teaching methodologies that you have used in your teaching?

Tutorial

Problem

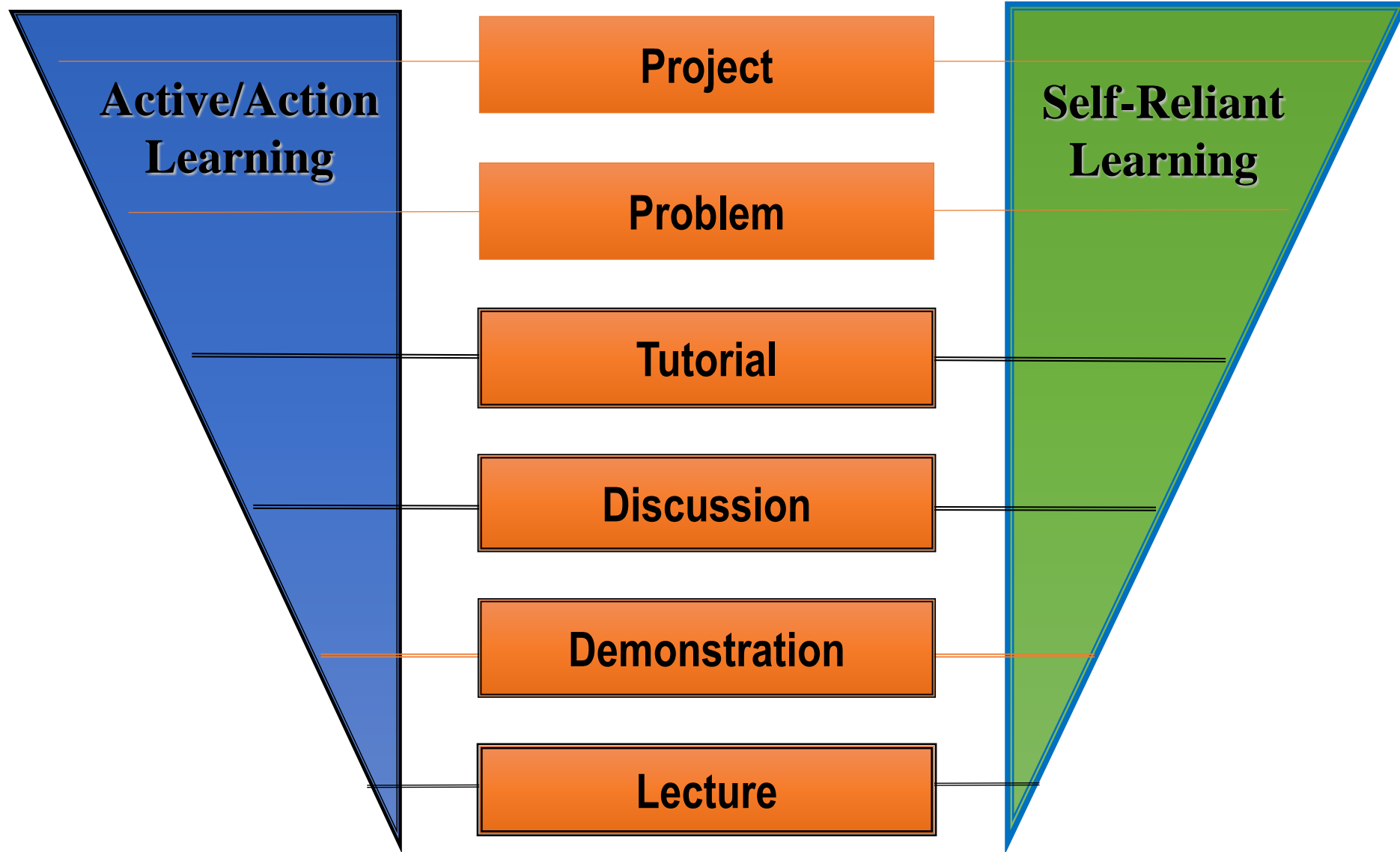
Discussion

Project

Lecture

Demonstration

Student Centred Approach



Teacher Centered Approach



Paradigm Shift

Teaching & Learning

TVET: Work Related Learning



- Independent
- Self Reliant Learner
- Autonomous
- Thinking
- Creative

Teacher



- Facilitator
- Organizer
- Coach
- Adviser
- Moderator



Five Key Changes to Practice Teaching That Promotes Learning

I. The Function of Content

Currently:

Penyampaian Materi ditujukan untuk membangun fondasi
Pengetahuan yang kokoh

1

The Change: Materi Ajar digunakan untuk membangun
pengetahuan baru dan mengembangkan **learning skills** dan
learner self-awareness

Learner-Centered Teaching: Five Keys Changes to Practice by Maryellen Weimer.

Five Key Changes to Practice Teaching That Promotes Learning

2. The Role of the Teacher

Currently:

Peran Guru/Dosen mendominasi aktivitas pembelajaran

2

The Change: Aktivitas pembelajaran fokus pada **students learning**

Learner-Centered Teaching: Five Keys Changes to Practice by Maryellen Weimer.

Five Key Changes to Practice Teaching That Promotes Learning

3. The Responsibility for Learning

Currently:

Kita memaksakan Pembelajaran kepada peserta didik yang kurang motivasi

3

The Change: Bersama peserta didik kita menciptakan **learning environments** yang dapat memotivasi mereka tanggap terhadap **pembelajaran** (autonomous)

Learner-Centered Teaching: Five Keys Changes to Practice by Maryellen Weimer.

Five Key Changes to Practice Teaching That Promotes Learning

4. The Processes and Purposes of Evaluation

Currently:

Kegiatan Evaluasi berorientasi pada penilaian dan sepenuhnya diselesaikan oleh Guru/Dosen

4

The Change: Aktivitas Evaluasi digunakan untuk mempromosikan pembelajaran dan mengembangkan **self and peer assessment skills**

Learner-Centered Teaching: Five Keys Changes to Practice by Maryellen Weimer.

Five Key Changes to Practice Teaching That Promotes Learning

5. The Balance of Power

Currently:

Kita membangun keputusan kunci bahwa Pembelajaran untuk Peserta didik

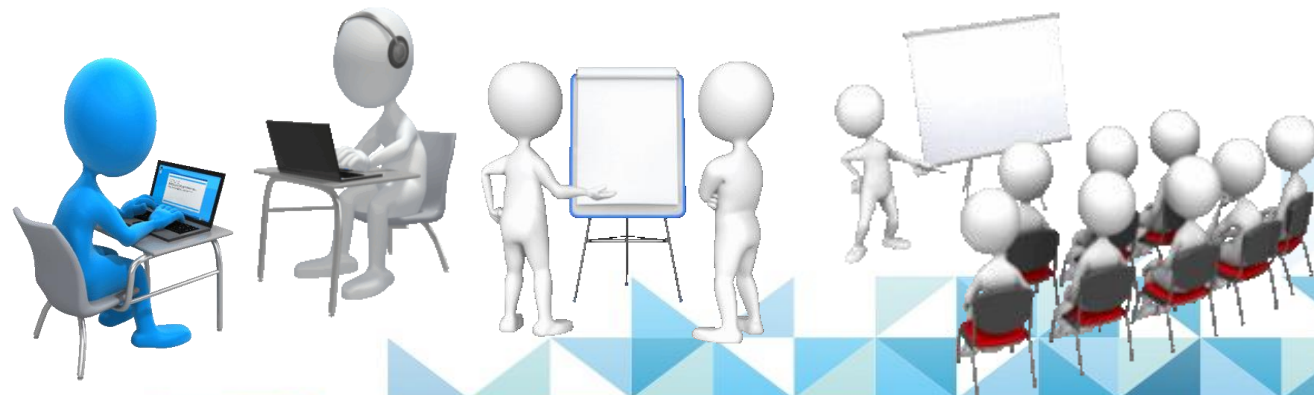
5

The Change: Bertanggung jawab secara etis, Guru/Dosen memutuskan belajar bersama dengan peserta didik.

Learner-Centered Teaching: Five Keys Changes to Practice by Maryellen Weimer.



Active/Action Oriented Learning



“**Learning** Comes First, **Teaching** Comes Second”

“Stop **Memorizing** and Start **Thinking**,”



Students learn more when they are intensely involved, and they are working in real life problems...
Collaborating with others in solving problems

US National Survey on Student Engagement, 2010

If we **CHANGE** our... **Belief**
than we will **CHANGE** our... **Thinking**



The Chain of Change

6 Reasons Why You Should Implement PBL

Promotes Self-directed Learning

Learners take the initiative to select their problem-solving approach and take ownership of learning

Enhances Critical and Creative Thinking Skills

Learners generate ideas, clarify concepts and explore alternative ways to solve problems

Allows Learners to Reflect on their Learning

Learners critically reflect on and make sense of their learning

Improves Information Searching Skills



Learners engage in inquiry...to solve problems and analyse information to make informed decision

Helps to Develop Collaborative and Deep Learning



Learners construct knowledge and solutions together with teammates guided by the facilitator

Creates Authentic Learning Opportunities

Learners gained knowledge and skills through solving real world problems

Source: (Republic Polytechnic, Singapore)

What is a Problem in Problem Based Learning?

“The principle idea behind PBL is that **the starting point for learning** should be a problem, a query or a puzzle.”

Boud, David (1998)

“Problems in PBL refer to the instructional materials presented to students to trigger their learning processes”

What the experts are saying ?

The nature of the problem is such that learner **experiences cognitive dissonance** (itchy factor). This will cause the learners to **examine what they think they know**.

“The problems are designed to **arouse** student curiosity, attempt to **engage** students in authentic and interesting types of activities, and prepare them to think critically and analytically.”

<http://www.ndtw.org/Blackboard/P2SST2/prob.htm>

What is PBL?



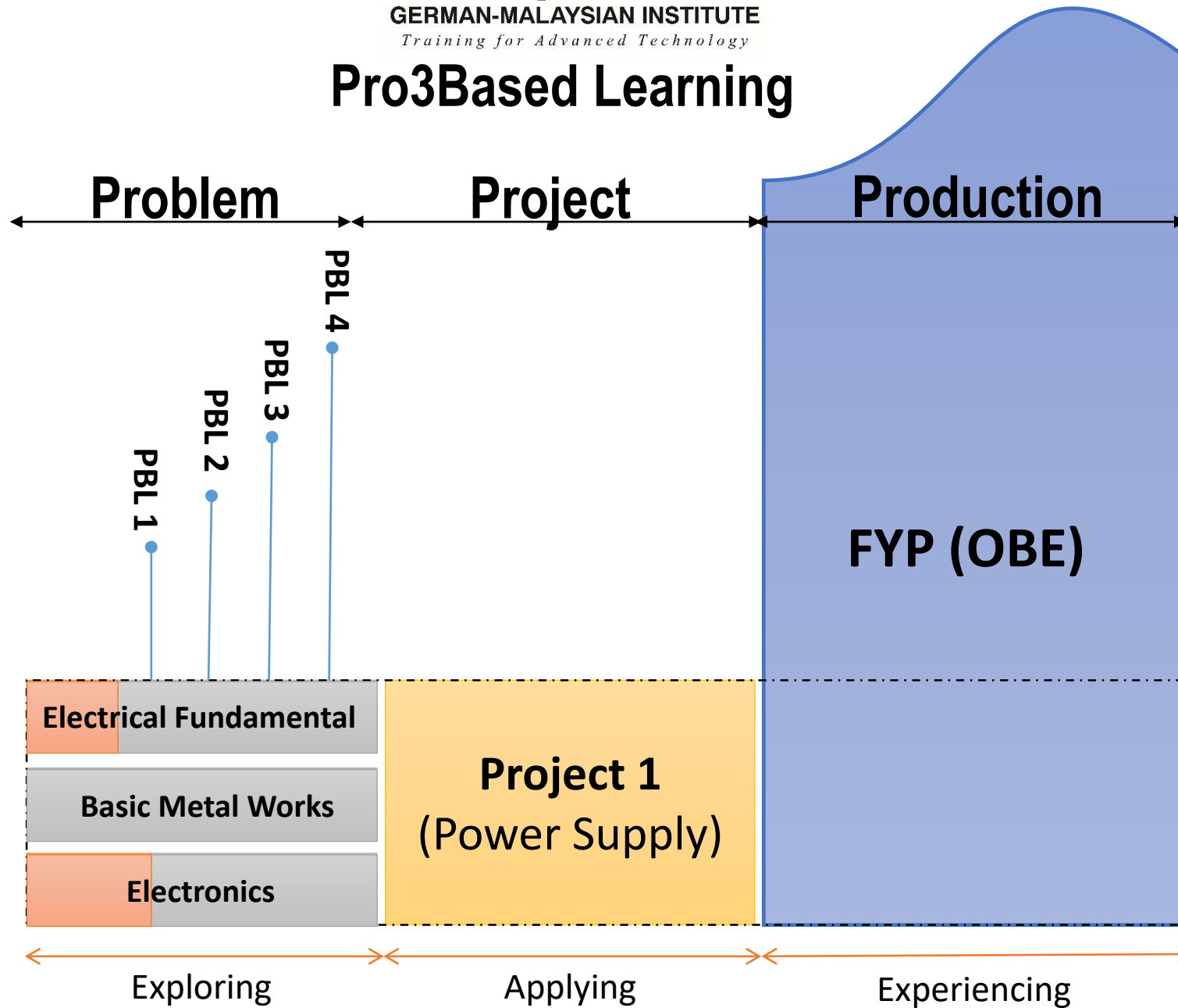
PBL
EBL
PBE
P3BL
Pro3BL

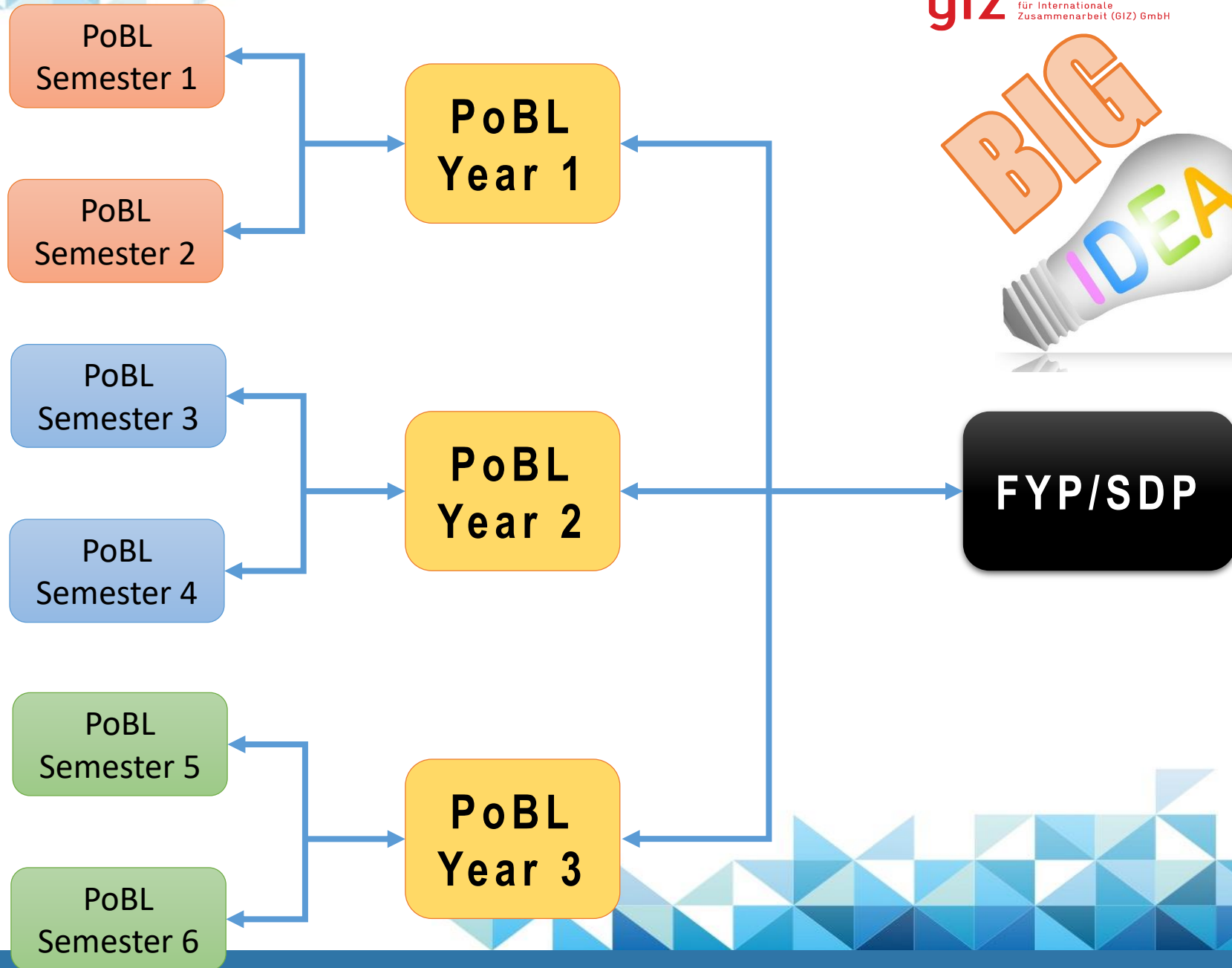
What we need...



PjBL & PBL Curriculum Design

Pro3Based Learning





Teacher Enhancement Workshop for PBL



Enhancement Program

- PBL Curriculum Design
- Problem Crafting
- Facilitation Skills

Deciding on Learning Issues/Big Q

Learning Outcome	Content	Total (hrs)	TCL (hrs)	SCL (hrs)	Learning Issues/ Big Q
1		6			
1.1		1	1		
1.2		1		1	PBL 1 (5 hrs)
1.3		1		1	
1.4		1		1	
1.5		2		2	
2		10			
2.1		1		1	PBL 2 (3 hrs)
2.2		1		1	
2.3		1		1	
2.4		1		1	PBL 3 (7 hrs)
2.5		2		2	
2.6		2		2	
2.7		2		2	

Deciding on Learning Issues/Big Q

Learning Outcome	Content	Total (hrs)	TCL (hrs)	SCL (hrs)	Learning Issues/ Big Q
1		6			
1.1		1	1		
1.2		1		1	PBL 1 (5 hrs)
1.3		1		1	
1.4		1		1	
1.5		2		2	
2		10			
2.1		1		1	PBL 2 (10 hrs)
2.2		1		1	
2.3		1		1	
2.4		1		1	
2.5		2		2	
2.6		2		2	
2.7		2		2	

Deciding on Learning Issues/Big Q

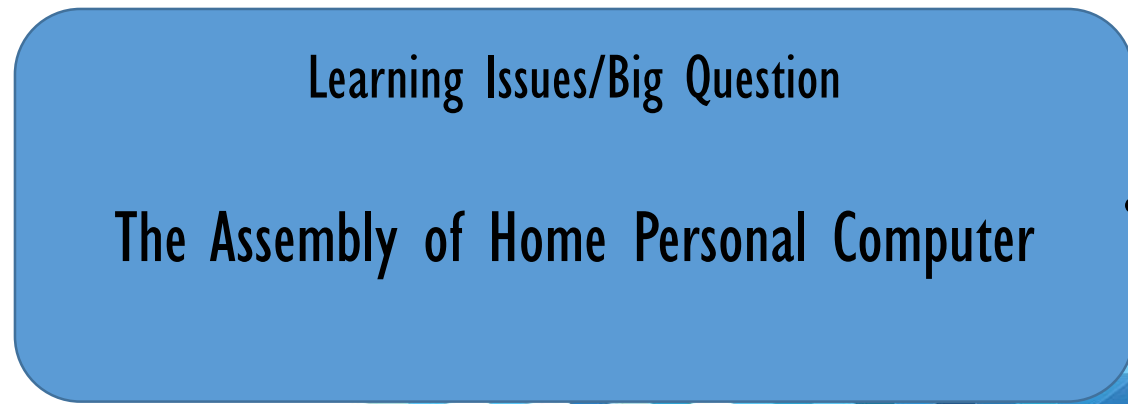
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1.4		1		1	
1.5		2		2	
2		10			
2.1		1		1	PBL 2 (3 hrs)
2.2		1		1	
2.3		1		1	
2.4		1		1	PBL 3 (7 hrs)
2.5		2		2	
2.6		2		2	
2.7		2		2	

Project Based Learning

Designing PBL Curriculum

Module Content	Duration (hrs)	Teacher Centered Learning (hr)	Student Centered Learning (Hr)
1	6		
1.1	1	1	
1.2	1		1
1.3	1		1
1.4	1		1
1.5	2		2

Problem Crafting





**MATUR NUWUN
MOGI RAHAYU PINANGGIH,
MAJU LAHIR lan BATHIN,
MANUNGGALING CIPTA RASA
KARSA,
MANUNGGAL KAUWA LAN GUSTI**